Tara K. Rajaniemi

Curriculum Vitae

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# Education

Ph.D., Biology, University of Michigan, 2001

B.A., Biology, Florida State University, 1995

# Experience

Professor, Biology Department, University of Massachusetts Dartmouth, 2018-present

Associate Professor, Biology Department, University of Massachusetts Dartmouth, 2010-2018

Assistant Professor, Biology Department, University of Massachusetts Dartmouth, 2004-2010

Post-doctoral Associate, Department of Biology, Indiana University, 2001-2004

Post-doctoral Associate, Department of Biology, University of Michigan, 2001

# Publications

(\*undergraduate student, \*\*graduate student)

Rajaniemi, T.K. and Barrett, D.T.\*\* (2018) Germination responses to abiotic stress shape species distributions on coastal dunes. Plant Ecology 219:1271-1282. DOI: 10.1007/s11258-018-0877-4

Rajaniemi, T.K., Goldberg, D.E., Turkington, R., and Dyer, A.R. (2012) Local filters limit species diversity, but species pools determine composition. Perspectives in Plant Ecology, Evolution, and Systematics 14:373-380. DOI: 10.1016/j.ppees.2012.09.004

Messina, D.S.\* and Rajaniemi, T.K. (2011) Does the seed bank reflect plant distributions in a coastal dune? Northeastern Naturalist 18:107-114. DOI: 10.1656/045.018.0110

Rajaniemi, T.K. (2011) Competition for patchy soil resources reduces community evenness. Oecologia 165:169-174. DOI: 10.1007/s00442-010-1710-5

Rajaniemi, T.K, Turkington, R., and Goldberg, D.E. (2009) Community level consequences of species interactions in an annual plant community. Journal of Vegetation Science 20: 836-846. DOI: 10.1111/j.1654-1103.2009.01086.x

Rajaniemi, T.K., and Allison, V.J. (2009) Abiotic conditions and plant cover differentially affect microbial biomass and community composition on dune gradients. Soil Biology and Biochemistry 41:102-109. DOI: 10.1016/j.soilbio.2008.10.001

Reynolds, H.L. and Rajaniemi, T.K. (2007) Plant interactions: competition. pp. 457-480 in Pugnaire, F. and Valladares, F. (eds.) Functional plant ecology, CRC Press LLC. DOI: 10.1201/9781420007626.ch15

Rajaniemi, T.K. (2007) Root foraging traits and competitive ability in heterogeneous soils. Oecologia 153:142-152. DOI: 10.1007/s00442-007-0706-2

Allison, V. J., Rajaniemi, T.K., Goldberg, D.E., and Zak, D.R. (2007) Quantifying direct and indirect effects of fungicide on an old-field plant community: an experimental null-community approach. Plant Ecology 190:53-69. DOI: 10.1007/s11258-006-9190-8

Rajaniemi, T.K., Goldberg, D.E., Turkington, R., and Dyer, A.R. (2006) Quantitative partitioning of regional and local processes shaping regional diversity patterns. Ecology Letters 9:121-128. DOI: 10.1111/j.1461-0248.2005.00855.x

Rajaniemi, T. K., and Reynolds, H.L. (2004) Root foraging for patchy resources in eight herbaceous species. Oecologia 141:519-525. DOI: 10.1007/s00442-004-1666-4

Rajaniemi, T.K., Allison, V.J., and Goldberg, D.E. (2003) Root competition can cause a decline in diversity with increased productivity. Journal of Ecology 91:407-416. DOI: 10.1046/j.1365-2745.2003.00768.x

Rajaniemi, T.K. (2003) Evidence for size asymmetry of belowground competition. Basic and Applied Ecology 4:239-247. DOI: 10.1078/1439-1791-00151

Rajaniemi, T.K. (2003) Explaining productivity-diversity relationships in plants. Oikos 101:449-457. DOI: 10.1034/j.1600-0706.2003.12128.x

Rajaniemi, T. K. (2002) Why does fertilization reduce plant species diversity? Testing three competition-based hypotheses. Journal of Ecology 90:316-324. DOI: 10.1046/j.1365-2745.2001.00662.x

Rajaniemi, T. K. and Goldberg, D.E. (2000) Quantifying individual- and community-level effects of competition using experimentally-determined null species pools. Journal of Vegetation Science 11:433-442. DOI: 10.2307/3236636

Goldberg, D.E., Rajaniemi, T., Gurevitch, J. and Stewart-Oaten, A. (1999) Empirical approaches to quantifying interaction intensity: competition and facilitation along productivity gradients. Ecology 80:1118-1131. DOI: 10.2307/177059

# Grants

Reduced mowing initiative on University of Massachusetts Dartmouth campus. (co-PI with Jennifer Koop, Jamie Jacquart, and Michele Bowers), UMass Dartmouth Multidisciplinary Seed Funding Program, 2017-2018, $6,500

SG: Connecting root foraging strategies to competitive outcomes and community structure (with co-PI Robert Drew), NSF Division of Environmental Biology, 2017-19, $140,456

REU Site: Integrative Marine Biology for the 21st Century (IMBio21) (co-PI with Nancy O’Connor), NSF Division of Biological Infrastructure, 2015-18, $343,070

Small-scale nutrient heterogeneity and root competition in a community context (with co-PI Robert Drew), NSF Division of Environmental Biology, 2013-14, $124,999

Promoting permaculture strategies for a robust local agriculture economy, University of Massachusetts President’s Creative Economy Initiative, (co-PI with Susan Jennings (UMD) and Ryan Harb (UMA)), 2012, $45,000 ($20,000 to UMD)

Guide to woody plants of our Living Classroom, Chancellor’s Public Service Grant, University of Massachusetts Dartmouth, 2011, $8076

Community management of natural resources at UMass Dartmouth, Undergraduate Research Grant,Office of Faculty Development, University of Massachusetts Dartmouth, 2010, $1,500

Recovery of ecosystem structure and function in a restored salt marsh, The Sounds Conservancy Program, Quebec-Labrador Foundation, 2009, $500

Healey Endowment Grant, Recovery of ecosystem structure and function in a restored salt marsh, University of Massachusetts Dartmouth, 2008, $6,500

Atlas Project: Optimizing restored salt marsh function, Jessie B. Cox Charitable Trust, 2007-2010, $60,000

Root foraging, competition, and coexistence in heterogeneous soils, National Science Foundation, 2002-2004, Co-PI with Heather Reynolds, $235,000

# Presentations

(\*undergraduate student, \*\*graduate student)

## Invited lectures

Rajaniemi, T.K. (2016) Using molecular markers to investigate plant interactions belowground. University of Massachusetts Amherst Plant Biology Seminar Series.

## Poster presentations by students

DeMolles, K.\*\*, Rajaniemi, T., Drew, R., Ralowicz, A.\*, and Chavre, H.\* (2018) Examining the effects of nutrients and neighbors on root foraging patterns for eight grassland species. University of Massachusetts Dartmouth Sigma Xi Research Exhibition and Ecological Society of America Annual Meeting.

Ralowicz, A.\*, Chavre, H.\*, DeMolles, K.\*\*, Rajaniemi, T., and Drew, R. (2018) Development of molecular markers for determination of root relative abundance. University of Massachusetts Dartmouth Sigma Xi Research Exhibition.

Barrett, D.T.\*\*, Rajaniemi, T.K., Bucci, V., and Silby, M. (2016) Effects of abiotic stressors and soil microbiota on the zonation of coastal dune plants. Intercampus Marine Science Graduate Symposium.

Barrett, D.T.\*\*, Rajaniemi, T.K., Bucci, V., and Silby, M. (2015) Effects of abiotic stressors and soil microbiota on the zonation of coastal dune plants. presented at Ecological Society of America Annual Meeting; Graduate Climate Conference, Woods Hole, MA; and New England Estuarine Research Society Fall Meeting.

Pierre, I.V.\* and Rajaniemi, T.K. (2015) Root foraging strategies in *Centaurea jacea*: response to combined cues of neighbors and resources. University of Massachusetts Dartmouth Sigma Xi Research Exhibition.

Exime, C. \*, Garlick, K.\*\*, Rajaniemi, T., and Drew, R. (2015) Designing genetic markers for belowground competition between plant species. University of Massachusetts Dartmouth Sigma Xi Research Exhibition.

Garlick, K.\*\* and Rajaniemi, T. (2014) Root foraging precision and its relationship to other functional traits. Ecological Society of America Annual Meeting.

Chude, C.\*, Vanasse, M.\*, Drew, R. and Rajaniemi, T. (2014) Small-scale heterogeneity and belowground root competition. University of Massachusetts Dartmouth Sigma Xi Research Exhibition.

Garlick, K.\*\* and Rajaniemi, T. (2014) Root foraging and its relationship to other functional traits. University of Massachusetts Dartmouth Sigma Xi Research Exhibition.

Gomes, K.,\* Drew, R. and Rajaniemi, T. (2014) Development of a genetic protocol for determining relative abundance of root species within a mixed field community. Sigma Xi Exhibition. University of Massachusetts Dartmouth Sigma Xi Research Exhibition.

Barrett, D.T.\*\* and Rajaniemi, T.K. (2010) Successful germination of Massachusetts coastal dune plant requires different environmental conditions. New England Estuarine Research Society Fall Meeting.

Breton, J.\*, Rajaniemi, T.K., Lilly, E.L, and Stahl, E. (2007) Microbial community diversity in two southern New England coastal ecosystems. Biology New England Southeast.

## Scientific meetings

Rajaniemi, T.K. (2014) Root foraging precision in interspecific competition. Ecological Society of America Annual Meeting.

Rajaniemi, T.K. (2010) Salt spray tolerance partially explains species distributions on a coastal sand dune. Ecological Society of America Annual Meeting.

Rajaniemi, T.K. and Breton, J.\* (2009) Soil microbial communities and soil chemical conditions in a recently restored salt marsh. Soil Ecology Society Annual Meeting.

Rajaniemi, T.K., Goldberg, D.E., and Turkington, R. (2008) Effects of biotic and abiotic filters on species diversity and composition in desert annual communities. Ecological Society of America Annual Meeting.

Rajaniemi, T.K. (2007) Controls on plant and microbial distributions in coastal dunes. Biology New England Southeast.

Rajaniemi, T.K., Goldberg, D.E., Turkington, R., and Dyer, A.R. (2005) Quantitative partitioning of regional and local processes shaping regional diversity patterns. International Botanical Congress.

Rajaniemi, T. K. (2005) Soil nutrient patchiness does not affect belowground competition. Ecological Society of America Annual Meeting.

Rajaniemi, T.K. (2004) Do root foraging traits determine belowground competitive ability? Ecological Society of America Annual Meeting.

Rajaniemi, T.K. and Reynolds, H.L. (2003) Root foraging strategies of herbaceous plants: trade-offs and size-dependence. Ecological Society of America Annual Meeting.

Rajaniemi, T.K. and Allison, V.J. (2000) Effects of aboveground and belowground competition on diversity along a productivity gradient. Ecological Society of America Annual Meeting.

Allison, V.J. and Rajaniemi, T.K. (2000) Mycorrhizal fungi influence plant community composition by changing competitive hierarchies. Ecological Society of America Annual Meeting.

Rajaniemi, T. K. and Goldberg, D.E. (1999) Effects of aboveground competition, belowground competition, and density on plant diversity. Ecological Society of America Annual Meeting.

Rajaniemi, T. K. (1997) The effect of competition on species diversity in a first-year old field. Ecological Society of America Annual Meeting.

## University Events

Grantham, R., and Rajaniemi, T.K. (2009) The campus as a living laboratory. Presentation to the UMass Dartmouth community.

Rajaniemi. T.K. (2009) Three community ecology stories: plant and microbial diversity in fields, dunes, and marshes. UMass Dartmouth Biology Department Seminar.

Rajaniemi, T.K. (2009) Null models in community ecology. CSUMS Seminar, UMass Dartmouth Math Department.

Rajaniemi, T.K. (2009) What should non-majors learn in science classes? Talking about Teaching, UMass Dartmouth.

Rajaniemi, T.K. (2006) What determines plant species diversity? UMass Dartmouth Biology Department Seminar.

Rajaniemi, T.K. (2005) Can forests absorb our excess carbon dioxide? UMass Dartmouth Earth Day 101.

Rajaniemi, T.K. (2003) Plant competition belowground: plant traits, competitive mechanisms, and community structure. Invited seminar at Kellogg Biological Station, Michigan State University.

## Public Events

Peterson, S., and Rajaniemi, T.K. (2009) Salt marsh function: past, present, and future. Public meeting, Fairhaven Town Hall.

Rajaniemi, T.K. (2007) Ecology of invasive plants. Presentation to Guild of Natural Science Illustrators, New England Chapter.

# Awards

Green Campus Award, Sustainability Initiative, University of Massachusetts Dartmouth, 2010

Finalist, John L. Harper Young Investigator’s Prize, British Ecological Society, 2002

# Professional Activities

Member, Ecological Society of America, 1997-present

Member, Sigma Xi Scientific Research Honor Society, 2013-present

Secretary, UMass Dartmouth Chapter, 2105-present

Symposium Co-organizer, International Botanical Congress, 2005

Integrating the dispersal-assembly and niche-assembly paradigms in plant community ecology

Working Group Member, National Center for Ecological Analysis and Synthesis, 1996-1997

Meta-analysis, interaction strength and effect size: application of biological models to the synthesis of experimental data

Manuscript Review

Animal Ecology; Annals of Botany; Botany; Ecography; Ecology; Ecosphere; Estuaries and Coasts; Evolutionary Ecology; Functional Ecology; Global Change Biology; International Journal of Ecology; Journal of Ecology; Journal of Vegetation Science; Marine and Freshwater Research; New Phytologist; Oecologia; Oikos; Perspectives in Plant Ecology, Evolution and Systematics; Plant Biology; Plant Ecology; Plant and Soil; PLoS One; Scientia Horticulturae; Wetlands

Proposal Review, NSF Division of Environmental Biology

Panelist for Doctoral Dissertation Improvement Grants, Preliminary proposals to Population and Community Ecology, Full proposals to Population and Community Ecology; ad hoc reviews

# Student Mentorship

## Graduate Advisor

Diana Barrett, MS 2012, PhD 2016

Kelsey Garlick, MS 2016 (joint w/ R. Drew)

Kelly DeMolles, MS 2019 (joint w/ R. Drew)

## Thesis Committee Member

Nicole Danaher-Garcia, PhD student

Gregory Costa, PhD student

Tammy Silva, PhD 2018

Jessie Lauze, MS 2016

Leah Smith, MS 2016

Kate Howland, MS 2014

Elsa Yeung, MS 2013

Elizabeth Spinney, MS 2013

Laura McCue, MS 2009

## Undergraduate Research

Gligorov Bazile, 2018

Rose Mase, 2018

Hudson Chavre, 2017-2018

Amelia Ralowicz, 2017-2018

Ashley Ciulla, 2015

Bryan Montano, 2015

Isabelle Pierre, 2015

Cynthia Chude, 2013-2014

Michelle Vanasse, 2013-2014

Mandy Furtado, 2013

Rebecca Guaraldi, 2009-2010

David Messina, 2009-2010

Steven Morse, 2006-2007

Emma Beach-Green, 2005-2006

# Teaching Experience

University of Massachusetts Dartmouth

Campus Biodiversity, BIO 103 (Honors course for non-science majors)

Ecology and Environmental Issues, BIO 143 (for non-science majors)

Biology of Organisms Laboratory, BIO 131

Biology of Populations Laboratory, BIO 211

Experimental Design and Analysis, BIO 214

General Ecology, BIO 314

Plant Biology, BIO 350

Community Ecology, BIO 402

Introduction to Biological Statistics, BIO 430

Capstone Research in Biology, BIO 499

Professional Communications, BIO 511 (team-taught course)

Introduction to the Arts and Sciences, CAS 101

Topics in Sustainability, SUS 202 (team-taught course)

Advanced Seminar in Sustainability Studies, SUS 450

Indiana University, Fall 2001, Ecology

# Service

## Department

Faculty Evaluation Committee, 2011-present

Assessment Committee, 2006-present; Chair, 2010-present

Curriculum Committee, 2013-present; Chair (temporary), Spring 2104, Spring 2015

Coordinator of Biology of Populations Laboratory, 2009-2018

Coordinator of Experiments in Ecology and Evolution Laboratory, 2018-present

Student Grant Awards Committee, 2006-2013; Chair, 2010-2013

Biology Student Association Advisor, 2005-2013

Search and Screen Committeee: Tenure-Track Faculty (committee co-chair), 2018; Professional Technician, 2014; Tenure-Track Faculty, 2007, 2010; Full Time Lecturer, 2008

Ad hoc Committees: Revision of departmental student course evaluations, 2007; Submission to Dean’s Curriculum Redesign Grant (Chair), 2015; Biology curriculum revision, 2016-2017

## College

Ad hoc Committee: Survey to evaluate directors of interdisciplinary minors in CAS, 2016

Science Academic Council, 2012-2013

## University

General Education Committee, 2016-2018

Jane Goodall Green Fair co-organizer, 2016

Proposal review, Office of Undergraduate Research, 2015-present

Secretary, Sigma Xi UMass Dartmouth Chapter, 2015-present

University Studies Cluster 2 Coordinator, 2012-2016

University Honors Committee, 2010-2012

Search and Screen Committee: Directory of Campus and Community Sustainability, 2009

Chancellor’s Colloquium Advisory Committee, 2013, 2014