

Robert Muscarella

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Citizenship: USA and Italy

Plant Ecology & Genetics

Norbyvägen 18D

Uppsala University

75236 Uppsala, Sweden

PROFESSIONAL APPOINTMENTS

- 2019 University Senior Lecturer (*Associate Professor*)
Department of Plant Ecology & Genetics
Uppsala University (Sweden)
- 2017-18 Postdoctoral Researcher
Aarhus University (Denmark)
Mentor: Henrik Balslev
- 2015-17 NSF Postdoctoral Research Fellow
Aarhus University (Denmark) & Wageningen University (the Netherlands)
Co-mentors: Jens-Christian Svenning and Frans Bongers

EDUCATION

- 2015 Ph.D., Columbia University (Ecology, Evolution and Environmental Biology)
Major professor: María Uriarte [Conferred February 11, 2015]
- 2008 M.S., University of Miami (Biology)
Advisor: Theodore H. Fleming
- 2001 B.A., Lewis and Clark College (Double Major in Biology and Environmental Studies)

PUBLICATIONS

31. Poorter, L, ... **R Muscarella** & 68 coauthors (*Accepted*) Wet and dry tropical forests show opposite successional pathways in wood density but converge over time. *Nature Ecology and Evolution*.
30. **Muscarella, R**, J Messier, R Condit, SP Hubbell, JC Svenning (2018) Effects of biotic interactions on tropical tree performance depend on abiotic conditions. *Ecology*. **99**: 2740-2750. DOI: 10.1002/ecy.2537
29. **Muscarella, R**, C Bacon, S Faurby, S Munch-Christiansen, JC Svenning, H Balslev (2018) Soil fertility and flood regime are correlated with phylogenetic structure of Amazonian palm communities. *Annals of Botany*. **123**: 641-655. DOI: 10.1093/aob/mcy196
28. Gei, MG, ... **R Muscarella** and 54 coauthors (2018) Ecological success of tropical legumes across succession and rainfall gradients. *Nature Ecology and Evolution*. DOI: 10.1038/s41559-018-0559-6
27. Eychenne, J, N Ortega, H Balslev, **R Muscarella** and F Stauffer (2018) Taxonomic revision, distribution and ecology of *Wedlandiella* (Arecaceae: Arecoideae: Chamaedoreae). *Webbia (TWEB)*. DOI: 10.1080/00837792.2018.1478378
26. Bachelot B, J Clark, M Uriarte, **R Muscarella**, N Swenson, J Thompson, K McGuire and JK Zimmerman (2017) Associations between tropical arbuscular mycorrhizal fungal communities and tree functional traits, seedling abundance, and foliar damage changes with tree seedling successional status. *Ecology*. **99**: 607-620. DOI: 10.1002/ecy.2122
25. Uriarte, M, **R Muscarella** and JK Zimmerman (2018) Environmental heterogeneity and biotic interactions mediate climate impacts on tropical forest regeneration. *Global Change Biology*. **24**: e692–e704. DOI: 10.1111/gcb.14000
24. Guérin M, D Martin-Benito, G von Arx, KL Griffin, L Andreu-Hayles, NG McDowell, W Pockman, **R Muscarella**, R Hamdan and P Gentine (2018) Inter-annual variations in needle and sapwood traits of *Pinus edulis* induced by an experimental drought. *Ecology and Evolution*. **8**:1655–1672. DOI: 10.1002/ece3.3743.

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PUBLICATIONS (*continued*)

23. Kass, JM, B Vilela, ME Aiello-Lammens, **R Muscarella**, C Merow and RP Anderson (2018) *Wallace*: a user-friendly web app for advanced spatial modeling of species niches and distributions. *Methods in Ecology and Evolution*. **9**: 1151-1156. DOI: 10.1111/2041-210X.12945
22. **Muscarella, R**, M Lohbeck, M Martínéz-Ramos, L Poorter, J Rodríguez-Velázquez, M van Breugel and F Bongers (2017) Demographic drivers of functional composition dynamics. *Ecology*. DOI: 10.1002/ecy.1990.
21. Kivlin, S, K Treseder, **R Muscarella** and C Hawkes (2017) The predictive power of ecological niche modeling for global arbuscular mycorrhizal fungal biogeography. Pages 143-158 in L Tedersoo, ed. *Biogeography of Mycorrhizal Symbiosis*. Springer International.
20. Galante, P, BA Alade, **R Muscarella**, SA Jansa, SM Goodman & RP Anderson (2017). Comparing two approaches for selecting optimal complexity in ecological niche models: information criteria vs. performance on withheld data. *Ecography*. DOI: 10.1111/ecog.02909.
19. Rasmussen K, J Thyrring, **R Muscarella** and F Borchsenius (2017) Climate change induced range shifts of three allergenic ragweeds (*Ambrosia* L.) in Europe and potential impact on human health. *PeerJ*. DOI: 10.7717/peerj.3104.
18. Lasky, J, M Uriarte & **R Muscarella** (2016) Synchrony, compensatory dynamics, and the functional trait basis of phenological diversity in a tropical tree community. *Environmental Research Letters*. **11**:115003.
17. **Muscarella, R**, M Uriarte, DL Erickson, NG Swenson, WJ Kress, JK Zimmerman (2016) Variation of tropical forest assembly mechanisms across regional environmental gradients. *Perspectives in Plant Ecology, Evolution, and Systematics*. **23**: 52-62.
16. Naeem, S, C Prager, B Weeks, A Varga, DFB Flynn, K Griffin, **R Muscarella**, S Wood & W Schuster (2016) Biodiversity as a multidimensional construct. *Proceedings of the Royal Society B*. **283** 20153005; DOI 10.1098/rspb.2015.3005
15. **Muscarella, R** and M Uriarte (2016) Do community-mean functional traits reflect optimal strategies? *Proceedings of the Royal Society B*. **283**: 20152434.
14. Chazdon, R, Broadbent E, Rozendaal DMA, ... **R Muscarella** & 54 coauthors (2016) Carbon mitigation potential of Neotropical second-growth forest. *Science Advances*. **2**(5): e1501639.
13. Poorter, L, ... **R Muscarella** & 64 coauthors (2016) Biomass resilience of Neotropical secondary forests. *Nature*. **530**(7589): 211-214.
12. **Muscarella, R**, M Uriarte, TM Aide, DL Erickson, J Forero-Montaña, NJ Swenson, WJ Kress & JK Zimmerman (2016) Functional convergence and phylogenetic divergence during secondary succession of subtropical wet forests in Puerto Rico. *Journal Vegetation Science*. **27**(2): 283-294.
11. Umaña, MN, J Forero-Montaña, **R Muscarella**, CJ Nytch, J Thompson, M Uriarte, JK Zimmerman & NG Swenson (2016) Inter-specific functional convergence and divergence and intraspecific negative density dependence underlie the seed-to-seedling transition in tropical trees. *American Naturalist*. **187**(1): 99-109.
10. **Muscarella, R**, M Uriarte, NJ Swenson, DL Erickson, JK Zimmerman & WJ Kress (2016). Climate and biodiversity effects on standing biomass in Puerto Rican forests. *Caribbean Naturalist*. **S1**: 199-217.
9. Letcher, SG, ... **R Muscarella** & 55 coauthors (2015) Environmental gradients and the evolution of successional habitat specialization: a test case with 14 Neotropical forest sites. *Journal of Ecology*. **103**(5): 1276-1290.

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PUBLICATIONS (*continued*)

8. Lasky, JR, B Bachelot, **R Muscarella**, N Schwartz, J Forero-Montaña, NG Swenson, J Thompson, JK Zimmerman & M Uriarte (2015) Ontogenetic shifts in trait-mediated mechanisms of plant community assembly. *Ecology*. 96: 2157-2169.
7. Réjou-Méchain, M, ... **R Muscarella** & 65 coauthors (2014) Spatial variation in forest biomass and consequences for remote sensing of carbon stocks. *Biogeosciences*. 11: 6827-6840.
6. **Muscarella, R**, M Uriarte, NJ Swenson, DL Erickson, JK Zimmerman & WJ Kress (2014). A well-resolved phylogeny of the trees of Puerto Rico based on DNA barcode sequence data. *PLoS ONE*. 9(11): e112843.
5. **Muscarella, R**, PJ Galante, M Soley-Gaurdia, RA Boria, J Kass, M Uriarte & RP Anderson (2014) ENMeval: an R package for conducting spatially independent evaluations and estimating optimal model complexity for Maxent ecological niche models. *Methods in Ecology and Evolution*. 5(11): 1198-1205.
4. **Muscarella, R**, M Uriarte, J Forero-Montaña, L Comita, NJ Swenson, J Thompson, C Nytch, I Jonckheere & JK Zimmerman (2013). Life history trade-offs during the seed-to-seedling transition in a subtropical wet forest community. *Journal of Ecology* 101(1): 171-182.
3. Yakulic, C, ME Fagan, M Jain, A Jina, Y Lim, M Marlier, **R Muscarella**, P Adame, RS DeFries & M Uriarte (2011) Biophysical and socioeconomic factors associated with forest transitions at multiple spatial and temporal scales. *Ecology and Society* 16(3): 15.
2. **Muscarella, R**, KL Murray, A Russell, D Ortt & TH Fleming (2011). Exploring demographic, physical, and historical explanations for the genetic structure of two lineages of Greater Antillean bats *PLoS ONE* 6(3): e17704.
1. **Muscarella, R** & TH Fleming (2007) The role of frugivorous bats in tropical forest succession. *Biological Reviews* 82(4): 573-590.

MANUSCRIPTS IN REVISION, REVIEW, PREPARATION (*drafts available upon request*)

- Muscarella, R**, S Kolyaie, JK Zimmerman and M Uriarte (*in revision*) Topography and climate interactively mediate tropical forest composition.
- Muscarella, R**, T Emilio, H Balslev and many other co-authors (*in prep*) Global patterns of palm abundance.
- Muscarella, R** and H Balslev (*in prep*) Palm community transects and soil properties in western Amazonia.
- Schwartz, NB, M Uriarte, X Feng, **R Muscarella**, NG Swenson, MN Umaña, JK Zimmerman (*in review*) Traits and topography modulate tree performance and drought response in a tropical forest.
- Khalyani, AH, WA Gould, MJ Falkowski, **R Muscarella**, M Uriarte and F Yousef (*in review*) Climate change alters environmental suitability and potential plant species composition and richness in Puerto Rico.

GRANTS AND AWARDS

- | | |
|------|--|
| 2018 | Merian Award for best presentation by an early career researcher. European Conference of Tropical Ecology. |
| 2018 | NSF, DEB - (Co-investigator): <i>A neighborhood approach to the biogeography of Puerto Rican trees</i> . (USD \$561,971) |
| 2017 | NSF, DEB - Long-Term Ecological Research (Senior Personnel): <i>LTER: SEV site - Climate variability at dryland ecotones</i> . (USD \$5,400,000) |
| 2017 | NSF, DEB - EAGER: <i>Collaborative Research: Environmental variability at dryland ecotones</i> . (USD \$276,566) |
| 2015 | Finalist, GBIF Nielsen Challenge for development of <i>Wallace</i> software (USD \$1,000) |
| 2015 | Outstanding Reviewer, Canadian Journal of Forest Research |

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GRANTS AND AWARDS (*continued*)

2014	NSF International Postdoctoral Research Fellowship (USD \$175,632)
2013	NSF Doctoral Dissertation Improvement Grant (USD \$13,000)
2010 - 13	Travel Grant, Institute for Latin American Studies (USD \$6,000 <i>total</i>)
2010 - 13	The Earth Institute Travel Grant, Columbia University (USD \$2,000 <i>total</i>)
2010	Highest Scientific Quality presentation, E3B Department, Columbia University
2010	Travel Grant, Columbia University (USD \$2,500)
2009 - 14	Faculty Fellowship, Columbia University (USD \$65,000)
2008	The Luis F. Bacardi Bat Conservation Award for Outstanding Oral Presentation, North American Society for Bat Research (USD \$500)
2007 - 08	The Max & Peggy Kriloff Scholarship, University of Miami (USD \$1,000 <i>total</i>)
2005	Graduate Activity Fee Allocation Committee, University of Miami (USD \$250)
2005	William H. Evoy Graduate Research Award, University of Miami (USD \$500)

TEACHING EXPERIENCE AND TRAINING

2019	Ecological Methods. Uppsala University, Sweden. Course coordinator.
2018	Tropical Ecosystems and Human Security. Aarhus University, Denmark. Co-taught semester-long course.
2015-18	EcoInformatics Methods Workshop. Aarhus University, Denmark. Organized seminar series on various techniques ecology and evolution research.
4/2015	Species Distribution Modeling in R. Uppsala University, Sweden. Collaboratively designed and instructed a 4-day course on distribution modeling.
2014	Teagle Summer Institute Teaching Certification. Columbia University, New York. Intensive training on developing innovative teaching methods using new technology.
2010-13	Course Teaching Assistant and Lab Instructor, Columbia University, New York. Fundamentals of Ecology and Evolution (2 semesters, <i>Supervisors: Maria Uriarte & Joel Cracraft</i>); Life Systems (1 semester, <i>Supervisor: Shahid Naeem</i>), Spatial Analysis and Modeling for Sustainable Development (<i>Supervisor: Giovanni Graziosi</i>).
2012-13	NSF GK-12 Teaching Fellow: Learning through Ecology and Environmental Field Studies, Public School MS-88, New York. Developed a one-year program of inquiry-based learning activities for middle school students.
2009	Biology Instructor, Portland Community College, Oregon. Taught biology course covering anatomy, physiology, zoology, botany, and ecology.
2006	Graduate Facilitator, University of Miami and Howard Hughes Medical Institute, Summer Research in Ecology Program.
2005-06	Teaching Assistant, University of Miami, Florida. Courses: Intro lab in Ecology (1 semester), Intro lab in Genetics and Evolution (1 semester, Genetics (1 semester, <i>Supervisor: Alex Wilson</i>).

PRIOR WORK EXPERIENCE (SELECTED)

2009	Botanic Specialist II, Urban Forestry, City of Portland, OR. Planned, developed, and managed programs and projects in support of the urban forestry policies.
2008	Bird Point Count Surveyor, Rocky Mountain Bird Observatory/USFS, Kaibab National Forest, Arizona. Conducted point counts and recorded vegetation data.
2007	Botany Research Assistant, Lambir Forest National Park, Malaysia. Collected plant physiological data, trained an assistant in field techniques (<i>Supervisor: S. Russo</i>).
2007	Field Biologist, Krakatau Islands World Heritage Site, Indonesia. Surveyed and initiated permanent forest plots (<i>Supervisor: R. Field</i>).

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PROFESSIONAL WORKSHOPS

- 2018 Applying for Grants from the European Research Council, Aarhus, Denmark.
- 2018 Good Grant Writing and the Danish Funding Landscape, Aarhus, Denmark.
- 2017 Biodiversity Dynamics in Space and Time. Aarhus Botanic Gardens, Aarhus, Denmark.
- 2015 Tropical Plant Collections: legacies from the past, essential tools for the future. Royal Danish Academy, Copenhagen, Denmark.
- 2015 Applications of Species Distributions Models for Biodiversity Studies in Northeast Puerto Rico. International Institute of Tropical Forestry, Puerto Rico.
- 2015 Integral Projection Models. British Ecological Society, Sheffield, UK.
- 2013 Monitoring biodiversity in a changing world: estimating occupancy dynamics in diverse ecosystems through single and multi-species Bayesian hierarchical models. Association for Tropical Biology and Conservation, Costa Rica.
- 2013 Macrosystems Training Workshop: Integrating Evidence on Forest Response to Climate Change: Physiology to Regional Abundance. Duke University, NC.
- 2013 Center for Tropical Forest Science, NSF Dimensions workshop. University of Washington, WA.

SELECTED PRESENTATIONS (* by invitation)

- 2018* Global patterns of palm abundance. *Monocots 2018. Natal, Brazil.*
- 2018 Global patterns of palm abundance. *European Network of Palm Scientists annual meeting. Gothenburg, Sweden.*
- 2018 Global patterns of palm abundance. *European Tropical Ecology Conference. Paris, France.*
(* Awarded best oral presentation for early career scientists)
- 2017* Global patterns of palm abundance. *University of Leeds, United Kingdom.*
- 2017 Demographic drivers of functional composition dynamics. *Ecological Society of America, Annual Meeting, Portland, OR, USA.*
- 2017* Global patterns of Palm Abundance. *Kew Royal Botanic Gardens, United Kingdom.*
- 2017* Global patterns of Palm Abundance. *University of Gothenburg, Sweden.*
- 2017* Demographic drivers of functional composition dynamics. *Biodiversity Dynamics in Space and Time. Aarhus Botanic Gardens, Denmark.*
- 2016* Integrating species traits and distributions: improving prediction for managing invasions. *USGS Fort Collins Science Center, USA.*
- 2015* Demographic drivers of functional diversity shifts during tropical forest succession. *Forest Ecology & Management, Wageningen University, the Netherlands.*
- 2015* How do abiotic gradients influence community assembly mechanisms? Insights from traits and tropical forests. *University of New Mexico, USA.*
- 2015* Do community-mean trait values reflect optimal strategies? *Ecology Society of America, 100th Annual Meeting, Baltimore, MD.*
- 2015* Species distribution models for the trees of Puerto Rico: methods and applications. *International Institute of Tropical Forestry, Puerto Rico.*
- 2015 Do community-mean trait values reflect optimal strategies? *Demography Beyond the Population, British Ecological Society, Sheffield, UK.*
- 2015* Linking geographic distributions and functional traits. *Forest Ecology & Management, Wageningen University, the Netherlands.*
- 2015 Linking geographic distributions and functional traits: insights from Puerto Rican forests. *International Biogeography Society, Bayreuth, Germany.*
- 2014 Functional and phylogenetic variation of Puerto Rican Forests. *Columbia University, NY.*
- 2013 Spatial turnover of taxonomic and functional tree diversity across broad environmental gradients in Puerto Rico. *ESA, Minneapolis, MN.*

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SELECTED PRESENTATIONS (*continued*)

- 2013 Functional and phylogenetic variation of Puerto Rican Forests. *Association for Tropical Biology and Conservation, San José, Costa Rica.*
- 2012 Do plants think globally and act locally? Exploring forest community composition across broad environmental gradients. *El Verde Research Station, Puerto Rico.*
- 2011 Do plants think globally and act locally? An integrated view of community assembly. *Princeton University, NJ.*
- 2009 The role of frugivorous bats in tropical succession. *North American Society for Bat Research, PA.*
- 2008 Does wind affect genetic structure and gene flow in two lineages of Greater Antillean bats? *North American Society for Bat Research, PA.*

PEER REVIEW WORK

Editorial: Review editor, *Frontiers in Forests and Global Change* (since 2018)

Funding bodies: *US National Science Foundation ad hoc reviewer, UK Natural Environment Research Council grant reviewer*

Journals: *Ecology Letters, Nature Ecology and Evolution, Journal of Ecology, Ecology, Global Ecology and Biogeography, Methods in Ecology and Evolution, New Phytologist, Functional Ecology, Ecography, Molecular Ecology, Journal of Applied Ecology, Biotropica, American Journal of Botany, Ecosphere, Canadian Journal of Forest Research, International Journal of Tropical Biology and Conservation, Forest Ecology and Management, Canadian Journal of Zoology, Acta Chiropterologica, Oecologica, Oikos, PLoS One, Plant Ecology, Annals of Forest Science, Journal of Forest Research, Trees - Structure and Function*

REFERENCES

Dr. María Uriarte

(PhD supervisor)

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Department of Ecology, Evolution, and
Environmental Biology
10th Floor Schermerhorn Ext.
1200 Amsterdam Ave.
New York, NY 10027
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Dr. Jens-Christian Svenning

(Postdoctoral mentor)

Professor
Department of Bioscience - Ecoinformatics and
Biodiversity
Ny Munkegade 116
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8000 Aarhus
Denmark
Email: svenning@bios.au.dk
Phone: (+45) 871-56-571

Dr. Robin Chazdon

(PhD committee member)

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Dr. Frans Bongers

(Postdoctoral mentor)

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