Rafael D'Andrea

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Appointments

2020-present: Assistant Professor, Department of Ecology and Evolution, Stony Brook University

2016-2020: Postdoctoral Research Associate., Department of Plant Biology, University of Illinois at Urbana-Champaign. Mentor: James P. O'Dwyer

Education

2016 Ph.D. Ecology and Evolutionary Biology, University of Michigan. Supervisor: Annette Ostling

2010 M.A. Physics: Stony Brook University

2008 M.S. Physics: Universidade Federal do Rio de Janeiro, Brazil

2005 B.S. (*cum laude*) Physics: Universidade Federal do Rio de Janeiro, Brazil

Manuscripts in Review and in Preparation

U. Poddar, T. Dong, V. Lee, K. Lam, P. Wilson, J. Gurevitch, **R. D'Andrea** (in Review) "Examining the drivers of forest invasibility using a community assembly framework".

A. Senthilnathan, P. Ke, X. Yan, K. Crawford, **R. D'Andrea** (in Preparation) "Challenges in linking plant-soil feedbacks to community structure".

A. Kandler, **R. D'Andrea**, J. O'Dwyer (in Preparation) "The Life History and Functionality of a Cultural Variant: Insight from Mismatches between Neutral Theory and Data".

M. Barbier, L. Bittleston, A. Clark, C. Cuellar-Gempeler, **R. D'Andrea**, V. Frans, G. Khattar, M.A. Leibold, Z. Miller, P. Peres-Neto, L. Pollock, N. Wisnoski (in Preparation) "Linking Pattern to Process in Metacommunities: Challenges and Opportunities".

B. Futcher, B. Skiena, C. Kocher, **R. D'Andrea** (in Preparation) "Eusocial reproduction selects for longevity" .

A. Ostling, H. Muller-Landau, **R. D'Andrea**, et al. (in Preparation) "Looking beyond the lamppost: future directions in understanding tropical tree diversity maintenance".

Peer-Reviewed Publications

1. N. Dean, Z. Zhang, **R. D'Andrea** (2025) "Assessing different management actions for the conservation of the grand skink (Oligosoma grande)", Journal for Nature Conservation 86. DOI: 10.1016/j.jnc.2025.126882
2. Senthilnathan, **R. D'Andrea** (2024) "Coexistence of competing plants under plant-soil feedback", Ecology Letters 27. DOI: 10.1111/ele.14503

3. U. Poddar, J. Gurevitch, S. J. Meiners, **R. D'Andrea** (2024) "Similar trait-based successional assembly in native and introduced plants despite species pool differences". Journal of Ecology. https://doi.org/10.1111/1365-2745.14304
4. **R. D'Andrea**, G. Khattar, V. Frans, L. Bittleston, T. Koffel, C. Cuellar-Gempeler (2024) "Reciprocal inhibition and competitive hierarchy cause negative biodiversity-ecosystem function relationships". Ecology Letters. https://doi.org/10.1111/ele.14356
5. J. P. O'Dwyer, R. Chisholm, **R. D'Andrea** (2024) "Neutral Ecology and Beyond". Encyclopedia of Biodiversity, Third Edition. Vol. 5, p 1-12.
6. L. R. Ginzburg, **R. D'Andrea** (2024) "Trophic Levels". Encyclopedia of Biodiversity, Third Edition. Vol. 5, p 252-258.
7. M. Umarani, D. Wang, J. P. O'Dwyer, **R. D'Andrea** (2024) "A spatial signal of niche differentiation in tropical forests". The American Naturalist. https://doi.org/10.1086/729218
8. Senthilnathan, **R. D'Andrea** (2023) "Niche theory for positive plant–soil feedbacks". Ecology. Apr;104(4):e3993
9. **R. D'Andrea**, J. O'Dwyer (2021). "Competition for space in a structured landscape: the effect of seed limitation on coexistence under a tolerance-fecundity tradeoff". Journal of Ecology. Apr;109(4):1886-97.
10. **R. D'Andrea,** Theo Gibbs, James P. O'Dwyer (2020) Emergent neutrality in consumer-resource dynamics. PLoS Computational Biology. Jul 30;16(7):e1008102.
11. **R. D'Andrea**, J. Guittar, J. O'Dwyer, H. Figueroa, J. Wright, R. Condit, A. Ostling (2020). "Counting niches: Abundance-by-trait patterns reveal niche partitioning in a Neotropical forest". Ecology. Jun;101(6):e03019.
12. **R. D'Andrea**, M. Riolo, A. Ostling (2019). "Generalizing clusters of similar species as a signature of coexistence under competition" PLoS Computational Biology. Jan 22;15(1):e1006688.
13. G. Barabás, **R. D'Andrea**, S. Stump (2018). "Chesson's coexistence theory". Ecological monographs. Aug;88(3):277-303
14. R. Rael, **R. D'Andrea**, G. Barabás, A. Ostling (2018). "Emergent niche structuring leads to increased differences from neutrality in species abundance distributions". Ecology. Jul;99(7):1633-43.
15. **R. D'Andrea**, A. Ostling, J. O'Dwyer (2018). "Translucent windows: how uncertainty in competitive interactions impacts detection of community pattern". Ecology Letters. Jun;21(6):826-35.
16. **R. D'Andrea**, J. O'Dwyer (2017) Can editors save peer review from peer reviewers? PLoS ONE 12(10): e0186111. https://doi.org/ 10.1371/journal.pone.0186111
17. **R. D'Andrea**, A. Ostling (2017). "Biodiversity maintenance may be lower under partial niche differentiation than under neutrality" Ecology 98 (12): 3211-3218. doi: 10.1002/ecy.2020
18. **R. D'Andrea**, J. O'Dwyer (2017). "The impact of species-neutral stage structure on macroecological patterns" Theoretical Ecology 10: 433-442. doi: 10.1007/s12080-017-0340-5
19. G. Barabás, **R. D'Andrea**, (2016). "The effect of intraspecific variation on community pattern and robustness" Ecology Letters 19.8: 977-986.

20. **R. D'Andrea**, A. Ostling (2016). "Challenges in Linking Trait Patterns to Niche Processes" Oikos 125: 1369-1385. doi: 10.1111/oik.02979
21. **R. D'Andrea**, A. Ostling (2015). "Can clustering in genotype space reveal 'niches'?" American Naturalist 187: 130-135
22. **R. D'Andrea**, G. Barabás, A. Ostling (2013). "Revising the Tolerance-Fecundity Trade-Off; or, On the Consequences of Discontinuous Resource Use for Limiting Similarity, Species Diversity, and Trait Dispersion." The American Naturalist 181.4: E91-E101.
23. G. Barabás, **R. D'Andrea**, R. Rael, G. Meszéna, A. Ostling (2013). Emergent Neutrality or Hidden Niches?" Oikos 122: 1565-1572.
24. G. Barabás, **R. D'Andrea**, A. Ostling (2012). "Species packing in nonsmooth competition models." Theoretical Ecology 6.1: 1-19.

Grants and Awards

2024-2026. NSF DEB-2312302. "Linking carbon preferences and competition to predict and test patterns of functional diversity in soil microbial communities" ($199,998)

2024. Godfrey Excellence in Teaching Award - Life Sciences. College of Arts and Sciences, Stony Brook University.

Conferences, Workshops, Invited Talks, Research Visits

NSF Workshop. "Coexistence Mechanisms in Reef Coral" 2025

Function of Evolving Systems Symposium (Simons Foundation) 2024

Higher biodiversity promotes higher ecosystem function, except when it doesn't: lessons from pitcher plants. *Seminar*. City College of New York. 2024

Reciprocal inhibition and competitive hierarchy cause negative biodiversity-ecosystem function relationships. *Oral Presentation*. ESA Annual Meeting 2024.

NSF Workshop. "The challenge of understanding what maintains tropical tree diversity today and of predicting the future of this diversity under global change" 2024

Microbial diversity and plant-soil feedbacks as drivers of ecological function and coexistence. *Seminar*. Princeton University. 2024

A spatial signal of partial niche differentiation in tropical forests. *Oral presentation*. Barro Colorado Island 100 Years Symposium. 2024

Ecosystem function increases with species diversity, except when it doesn't: insights from pitcher plant microbial community models. *Oral presentation*. ESA Mid-Atlantic Chapter Annual Meeting. 2023

Quantifying niche differentiation by soil condition in tropical forests. *Oral Presentation*. ESA Annual Meeting. 2022

NSF Workshop. "Merging Statistical Theory And Analyses At The Interface Of Microbial And 'Macrobial' Ecology" 2022

Do competing species coexist via differences or via similarities? Models and data say it's not so simple. *Webinar*. Institute for Advanced Computational Science, Stony Brook University 2021.

Counting niches: Can spatial patterns reveal niche partitioning in tropical forests? *Webinar*. International Initiative for Theoretical Ecology 2021.

Competition and Biodiversity Patterns in Diverse Communities. *Seminar*. Biocomplexity seminar series, University of Illinois 2019.

Competition and Biodiversity Patterns in Diverse Communities. *Seminar*. Bradley University 2019.

Species clusters and ecological niches: Trait-abundance patterns reveal niche strategies in a Neotropical forest. *Oral presentation*. ESA Annual Meeting2018.

Research visit to Smithsonian Tropical Research Institute and Barro Colorado Island, Panama. 2018.

The new limiting similarity: clusters of similar species as a signature of niche differentiation. *Poster*. Boston University Theory in Biology Meeting 2018.

The new limiting similarity: clusters of similar species as a signature of niche differentiation. *Oral presentation*. Midwest Mathematical Biology Conference 2018.

The new limiting similarity: clusters of similar species as a signature of niche differentiation. *Poster*. Simons Conference on Theory & Biology 2018.

Mentoring

Postdoctoral researcher supervisor

- Athmanathan Senthilnathan
- Mihir Umarani

PhD student advisor

- Carlos Morantes Ariza
- Urmi Poddar
- Noah Dean
- Henry Chao
- Jack Chaillet
- Sixto Taveras Lopez

Master student advisor

- Rachael Sclafani

PhD committee member

- Ariek Norford
- Emma Thalis
- Charles Kocher
- Nicolas Anderson
- Alex Chege
- Anna Thonis
- Eva Arroyo
- Alba Loreto

Undergraduate research supervisor

- Santiago Peralta
- Idrees Bedar
- Timothy Gonzalez
- Sabiq Shahab
- ZhanPeng Zheng
- Jennifer Cao
- Jack Schaffer
- Anthony Mauri

High school AP bio research supervisor

- Dmitris Salas
- Oscar Wang

Teaching

Principles of Ecology (2024). Stony Brook University

Plant Ecology (2024). Stony Brook University

Population and Community Ecology Computer Lab (Spring 2021, 2022, 2023). Stony Brook University

Graduate Seminar in Population and Community Ecology (Spring 2022). Stony Brook University

Communication and Outreach

R. D'Andrea (2019). Trait-Based Clustering As An Indicator Of Species Competition. Science Trends.

J. Brock (2017). Strategies to sidestep selfish peer reviewers. Nature Index.

Guest lecture at Bard Prison Initiative, NYSDOC Eastern Correctional Facility, Napanoch, NY (2022)

Coordinator of Stony Brook University's public science lecture series (2020-present)

Editor Service

PLOS Computational Biology (Academic Editor)

Frontiers in Ecology & Evolution (Review Editor)

Grant and Journal Reviewer Service

NSF DEB grant review
Theoretical Population Biology
Nature Ecology & Evolution
Theoretical Ecology
Trends in Ecology & Evolution
Nature Communications
Ecology Letters
American Naturalist
Ecology and Evolution
Journal of Ecology

Ecology
Journal of Theoretical Biology
Oikos
Plant Science Today
Ecography

Cell Systems
Journal of Animal Ecology
Oecologia
Annals of Botany