

SENAY YITBAREK, Ph.D.

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EDUCATION

- 2016 Ph.D., Biology – Ecology and Evolutionary Biology, University of Michigan
Advisor: Dr. John H. Vandermeer
- 2011 M.S., Biology – Ecology and Evolutionary Biology, University of Michigan
Advisor: Dr. John H. Vandermeer
- 2008 B.A., Agricultural Ecology, University of California Berkeley
Advisor: Dr. Miguel Altieri
- 2006 Agricultural Exchange Program in Brazil, Federal University of Santa Catarina
- 2005 A.A., General Studies, Riverside Community College

CURRENT POSITION

2017 – present. **National Science Foundation Postdoctoral Fellowship in Biology**, Department of Integrative Biology. University of California Berkeley.
Advisor: Dr. Mike Boots

FELLOWSHIPS, HONORS, AND GRANTS

- 2019 **Gordon Research Conference Carl Storm Fellowship**, \$ 1000
- 2018-19 **Vector Behavior in Transmission Ecological Research Network**, \$5000
- 2017 **Postdoctoral Research Fellowship in Biology**, National Science Foundation \$207,000.
- 2016 **Rackham One-Term Dissertation Fellowship**, University of Michigan \$10,200
- 2016 **IDEAS Research Exchange**, Princeton University \$3000
- 2015 **Invasion Ecology Research Exchange**, Colorado State University \$3000
- 2013 **Rackham Graduate Student Research Grant**, University of Michigan \$3000
- 2013 **Tinker Travel Grant**, University of Michigan \$1500
- 2013 **Rackham International Research Award**, University of Michigan \$6000

- 2011-15 **Rackham Summer Block Grant**, University of Michigan \$10,000 total.
- 2011 **Rackham Merit Fellowship**, University of Michigan \$63,252
- 2010 **Rackham Travel Grant**, University of Michigan \$ 1500
- 2010 **Alliances for Graduate Education and the Professoriate Grant**,
University of Michigan \$ 2500
- 2007 **Ronald E. McNair Scholarship Grant**, University of California Berkeley \$ 5000
- 2007 **Stronach Post-Baccalaureate Prize**, University of California Berkeley \$ 25000
- 2006 **Latin American Studies Travel Grant**, University of California Berkeley \$ 15000
- 2006 **US-Brazil Consortium** on Agricultural Ecology, USDA \$ 6000
- 2005 **Miller Scholarship Grant**, University of California Berkeley \$ 5000

PUBLICATIONS

Yitbarek, S., Guittar J., Knutie S.A., Ogbunugafor C.B. Deconstructing higher-order interactions in the microbiota. *In revision, Journal of Animal Ecology* (preprint: doi.org/10.1101/647156)

Yitbarek, S., Philpott S.P. Dominance hierarchies drive local twig-nesting ant abundance patterns in a tropical agroecosystem. *In revision, Peer J.* (preprint: doi.org/10.1101/442632)

Vandermeer, J.H., & 27+ coauthors including **Yitbarek, S.** The community ecology of herbivore regulation in an agroecosystem: lessons from complex systems. *In press, Bioscience.*

Yitbarek, S., Vandermeer, J.H., I. Perfecto. Parasite mediated competition facilitates invasion. *In review.* (preprint: doi.org/10.1101/16725)

Yitbarek, S., Vandermeer, J.H. 2017. Reduction of species coexistence through mixing in a spatial competition model. *Theoretical Ecology.* 10: 443-450. doi.org/10.1007/s1208001703414

Yitbarek, S., Vandermeer, J.H., and Perfecto, I. 2017. From insinuator to dominator: a unique mechanism for an exotic ant. *Diversity and Distributions.* 23:820-827. doi.org/10.1111/ddi.12568

Vandermeer, J.* and **S. Yitbarek (*equal authorship)**. 2012. Self-organized spatial pattern determines biodiversity in spatial competition. *J. Theor. Biol.* 300: 48-56. doi.org/10.1016/j.jtbi.201201005

Yitbarek, S., Vandermeer, J.H., and Allen, D. 2011. The combined effects of exogenous and endogenous variability on the spatial distribution of ant communities in a forested ecosystem. *Ecol. Entomol.* 40: 1067-1073. doi.org/10.1016/s00405809

Yitbarek, S. 2008. Reconsidering Invasive Grass and Mowing Impacts on Native Arthropod Populations in a Restored Grassland, *McNair Research Journal* 15: 143-162.

PRESENTATIONS

INVITED TALKS

2019: The California Academy of Sciences, San Francisco

2019: Department of Botany, University of Wisconsin Madison

2019: Department of Ecology and Evolutionary Biology, Tulane University

2019: The Joint Berkeley Initiative for Microbiome Sciences, UC Berkeley

2019: Department of Entomology, UC Riverside

2014: Arecibo Observatory, Puerto Rico

ORAL PRESENTATIONS

Yitbarek, S. Effects of feeding behaviors and mortality on pathogen coinfection prevalence in vectors. VectorBite Annual Meeting, Trento, Italy. **August 2019**

Yitbarek, S. Spatial competition of bacteriophages across different environments. Ecology Society of America Annual Meeting, New Orleans, LA. **August 2018**

Yitbarek, S. The Shuri Effect: A new generation of black ecologists? Ecology Society of America Annual Meeting, New Orleans, LA. **August 2018**

Yitbarek, S. Disease dynamics in invasive ants: The role of parasites in the global spread of the little fire ant *Wasmannia auropunctata*. Ecological Society of America Annual Meeting, Ft. Lauderdale, FL. **August 2016.**

Yitbarek, S. Reduction of species coexistence through mixing in a spatial competition model. Ecological Society of America Annual Meeting, Baltimore, MD. **August 2015.**

Yitbarek, S. Assembling Meta-Communities: Self-organized spatial mosaics maintain biodiversity. Summer Institute Symposium, Ann Arbor MI. **August 2011.**

Yitbarek, S. Ants in Space: Competitive intransitivity promotes mosaic pattern formation. EEB Theoretical Ecology Seminar, Ann Arbor, MI. **September 2010**

Yitbarek, S. Aquatic Subsidies Along a Sand Dune Ecosystem. University of Michigan Biological Station, Ann Arbor, MI. **August 2008.**

POSTER PRESENTATIONS

Yitbarek, S. Spatial structure as a mechanism for pathogen diversity. Ecology and Evolution of Infectious Disease, Princeton, NJ. **August 2019**

Yitbarek, S. Parasite mediated competition facilitates ant invasions. Ecology and Evolution of Infectious Disease, Santa Barbara, CA. **August 2017.**

Yitbarek, S. The combined effects of exogenous and endogenous variability on the spatial distribution of ant communities in a forested ecosystem. Ecological Society of America Annual Meeting, Pittsburgh, PI. **August 2010.**

TEACHING AND MENTORING EXPERIENCE

GUEST LECTURE

- 2018 **Guest lecturer,** Tropical Agroecosystems
University of California Santa Cruz
- Taught undergraduates about biological invasions in island ecosystems.
- 2015 **Guest lecturer,** Life decoded: Genomics in Society (**Bio 144**)
University of Michigan Ann Arbor.
- Taught undergraduates about evolution of insect reproductive systems.
- 2014 **Guest lecturer,** Deep Time: The Science of Origins (**Honors 242**).
University of Michigan Ann Arbor.
- Taught undergraduates about the origins of life including discussion on RNA evolution, origins of organic molecules, and fossil records.

COURSES

- 2015 **Teaching Assistant,** Life decoded: Genomics in Society (**Bio 144**).
University of Michigan Ann Arbor.
- Led weekly discussion sessions to non-biology majors, developed exams and evaluated student performances.
- 2014 **Teaching Assistant,** Deep Time: The Science of Origins (**Honors 242**).
University of Michigan Ann Arbor.
- Led weekly discussion sessions to LSA honors students covering materials in physics, astronomy, biology, and history of science.
- 2013 **Teaching Assistant,** Intro Biology (**EEB 173**). University of Michigan.
- Led weekly lab sessions to train students in basic lab skills including cloning by Plasmid & PCR. Developed exams and evaluated student performance.
- 2011 **Teaching Assistant,** Intro Biology (**EEB 101**). University of Michigan.
- Led weekly discussion sessions to non-biology majors, developed exams, evaluated student performance.
- 2010 **Teaching Assistant,** Ecology and Evolution of Infectious Diseases (**EEB 315**).
- University of Michigan. Lectured at weekly review sessions, developed exams, evaluated student performance.

MENTORING

2017-19 **University of California, Berkeley.**

- I supervised four undergraduate students in their independent research projects using experimental evolution to study host-parasite interactions.

2011-16 **University of Michigan, Ann Arbor.**

- I supervised one undergraduate honors student in spatial modeling.
- I mentored two undergraduates from Puerto Rico in tropical field biology.
- I mentored one undergraduate student in invasion biology.

2008-12 **Diversity Recruitment Partnership, University of Michigan**

- I advised and mentored undergraduate students from Historically Black Colleges including Howard university, Morehouse College, Tuskegee university, and the University of Missouri at St. Louis about graduate school opportunities. I helped students design field projects and analyze their data at the E.S. George Reserve.

RESEARCH EXPERIENCE

2017 **Postdoctoral Research**, Department of Integrative Biology, University of California Berkeley.

Advisor: Mike Boots

- Research: *Disease evolution: The consequences of spatial structure and co-infection on virulence evolution*. I am utilizing experimental evolution and mathematical modeling approaches to understand co-infection dynamics in spatially structured host populations.

2011-16 **Doctoral research**: Department of Ecology & Evolutionary Biology, University of Michigan Ann Arbor.

Advisor: John H. Vandermeer

- Research: *Population level consequences of spatial networks: Species coexistence and implications for invasive species*. I developed spatial network models to understand species coexistence patterns and conducted field experiments in Mexico and Puerto Rico to study biological ant invasions.

2008-10 **Master's research**: Department of Ecology & Evolutionary Biology, University of Michigan Ann Arbor.

Advisor: John H. Vandermeer

- Research: *The combined effects of exogenous and endogenous variability on the spatial distribution of ant communities*. I conducted field experiments in a temperate forest reserve in Michigan that examined the role of biotic and abiotic factors in determining the distribution of ground foraging and arboreal ant species.

2006-7 **Undergraduate Research**: McNair Scholars Program, the University of California Berkeley.

Advisor: Stephen Welter

- Research: *The role of invasive species management on the diversity of native arthropod communities*. I conducted field experiments to assess the impacts of mowing of invasive plants species on native arthropod communities.

SCIENCE OUTREACH AND SERVICE

- 2018 **Member, Committee Diversity and Education, Ecological Society of America**
Developing a Strategic Plan and educational programming related to raising public awareness and understanding of ecology.
- 2017 **Panelist, Ecological Society of America Annual Meeting, New Orleans, Strategies for Ecology, Education, Diversity, and Sustainability Minority Ecologists Forum**
As a panel member, representing the Black Ecologists Chapter in the Ecological Society of America (ESA), I shared my experiences on my career path as a minority scientist. In collaboration with partner sections, I developed ideas to increase and strengthen diversity within ESA as a society.
- 2016-present **Founding member and Current Chair, Black Ecologists Section**
Serving the professional, social, and cultural interests of black ecologists.
- 2015-16 **Volunteer, Bio-blitz at D-Town Farm in Detroit, Michigan**
Conducted biological surveys on a 5-acre organic farm owned by the Detroit Black Farmers to help guide small groups of African-American students in identifying variety of species present on the farm.
- 2009-10 **Ambassador, National Center for Institutional Diversity**
Talked to undergraduates at Penn State University (PA) and Eastern Michigan University (MI) about applying to and thriving in graduate school.

PROFESSIONAL SERVICE AND MEMBERSHIPS

COMMITTEE WORK

- 2016 **Early Career Scientist Symposium Scientific Committee, University of Michigan**
Graduate student representative of early career scientific committee on the topic of eco-evolutionary community assembly processes. Assisted in nominating and selecting symposium speakers, programming symposium, and facilitating discussion among panel and audience members.
- 2011 **Graduate Student Representative, EEB Diversity Committee**
Helped write NSF-funded summer research program (ED-QUE²ST) for first and second-year college students from backgrounds under-represented in ecology and evolutionary biology.

REVIEWER:

PLOS ONE, Journal of Animal Ecology, Ecology, PLOS Computational Biology

SOCIETY MEMBERSHIP:

Ecological Society of America, The Society for the Study of Evolution

SYMPOSIA ORGANIZED

- 2018 **“Averting the Tragedy of the Commons: Critical feedbacks across scales from Microbes to Humans”**, Ecological Society of America Annual Meeting, New Orleans
- 2018 **“Evolutionary Epidemiology Across Multiple Scales”**, Joint Congress on Evolutionary Biology, Montpellier.

WORKSHOPS ATTENDED

- 2019 **Vector Behavior in Transmission Ecology**, Trento, Italy.
- 2018 **NextProf Science: Future Faculty Workshop**, Ann Arbor, Michigan.
- 2017 **Vector Behavior in Transmission Ecology**, Imperial College in London, UK.
Infectious Disease Evolution Across Scales, New Orleans, Louisiana.
- 2014 **Animal Social Networks NIMBios**, Knoxville, Tennessee.

MISCELLANEOUS SKILLS

Computer: Python, Matlab, R, Mathematica, Markdown, HTML

Languages: Tigrinya (Native), Dutch (Native), English (Proficient), German (Proficient), Spanish (Proficient), Portuguese (Proficient).

REFERENCES

1. Dr. Mike Boots
University of California Berkeley
mboots@berkeley.edu
2. Dr. John H. Vandermeer
University of Michigan Ann Arbor
jvander@umich.edu
3. Dr. Britt Koskella
University of California Berkeley
bkoskella@berkeley.edu