

March 2024

CURRICULUM VITAE

JACOB MICHAEL HEILING, PhD

Assistant Professor of Plant Ecology
Department of Biology
Western Carolina University
Cullowhee, NC, USA

CONTACT

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EDUCATION

PhD, Biology
2015-2019
North Carolina State University, Dept. of Applied Ecology
Advisor: Rebecca E. Irwin

Doctoral student
2014-2015
Dartmouth College, Ecology and Evolutionary Bio., Dept. of Biological Sciences
Advisor: Rebecca E. Irwin

BS Biology
2009-2013
University of Texas at Austin, Ecology, Evolution, & Behavior Program, Integrative Biology

ACADEMIC APPOINTMENTS

2023-Present
Assistant Professor of Plant Ecology, Western Carolina University

2021-2023
Postdoctoral Fellow, Koski Lab, Department of Biological Sciences, Clemson University

2019-2020
Postdoctoral Teaching Fellow, Inouye-Underwood Lab, Department of Biological Science,
Florida State University

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PUBLICATIONS

2024 Heiling J.M., M.H. Koski

Divergent gametic thermal performance and floral warming across an elevation gradient
Evolution, Volume 78, Issue 4, 1 April 2024, Pages 665–678,
<https://doi.org/10.1093/evolut/qpad237>

2023 Heiling J.M., R.E. Irwin, W.F. Morris.

Conflicting constraints on male mating success shape reward size in pollen-rewarding plants
Special Issue - *Pollen as the link between phenotype and fitness*. American Journal of Botany
e16158

2022 Mutz, J.; **J.M. Heiling**; M. Paniagua-Montoya; S. Halpern; B. Inouye; N. Underwood.
Some neighbors are better than others: variation in associational effects among plants in an
old field community. Journal of Ecology JEcol-2021-1085

2021 Heiling J.M., J.L. Bronstein, R.E. Irwin.

Nectar addition changes pollinator behavior but not plant reproduction in pollen-rewarding
Lupinus argenteus. American Journal of Botany 108(3): 402-410. DOI:10.1002/ajb2.1613
Cited as an issue highlight

2020 E Lichtenberg* co, **JM Heiling* co**, JL Bronstein, & JL Barker.

Noisy communities and signal detection: why do foragers visit rewardless flowers?
Philosophical Transactions of the Royal Society B 375: 20190486. DOI:
10.1098/rstb.2019.0486

2019 Heiling JM, D Cook, ST Lee, & RE Irwin.

Pollen and vegetative secondary chemistry of three pollen-rewarding lupines.
American Journal of Botany 106(5), 1–13. DOI: 10.1002/ajb2.1283
Cited as an issue highlight.
Issue cover photo.



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2018 Heiling JM, H Ellison, T Ledbetter, S Richman, JL Bronstein, & RE Irwin. Why Are Some Plant—Nectar Robber Interactions Commensalisms? Oikos 127(11), 1679-1689. DOI: 10.1111/oik.05440
Issue cover photo.



2018 Blonder B, RE Kapas, RM Dalton, BJ Graae, **JM Heiling**, & ØH Opedal. Microenvironment and functional-trait context dependence predict plant community dynamics. Journal of Ecology 106(4), 1323-1337. DOI: 10.1111/1365-2745.12973

2016 Heiling JM & LE Gilbert. Cyanide two-step: Fruits lead and seeds follow in the chemical phenology of a sub-tropical cherry. Southwestern Naturalist 61(1), 57-61. DOI: 10.1894/0038-4909-61.1.57

FUNDING

2024 RMBL PI Fellowship \$2,000

2024 WCU Provost's Scholarship Development Award \$14,913

2023 RMBL PI Fellowship \$2,780

2021 NSF CLB Supplement (2205525) \$12,920

2021 RMBL Research Fellowship Award \$2,500

2020 Western North American Naturalist Natural History Grant \$2,000

2020 RMBL PI Fellowship \$800

2019 Florida State University Postdoctoral Teaching Scholar Fellowship \$47,658

2019 RMBL Postdoctoral Fellowship \$600

2018 RMBL Graduate Fellowship Snyder Endowment \$380

2018 NCSU Harkema Award \$350

2018 NCSU Biology Graduate Program Travel Award \$500

2017 RMBL Graduate Fellowship \$845

2016 Colorado Mountain Club Kurt Gerstle Fellowship \$2,000

2016 RMBL Fellowship \$770

2015 North Carolina State University Graduate Fellowship \$4,000

2015 Colorado Mountain Club Al Ossinger Fellowship \$2,000

2015 RMBL Graduate Fellowship \$150

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2015 BSA Graduate Student Research Award \$500

2014 McCulloch Graduate Fellowship \$5,000

2013 Ari Yehiel Blattstein Endowed Presidential Scholarship \$2,000

2012 NSF REU

TEACHING AND COURSE PRODUCTS

2024 *Instructor of record*: Undergraduate independent research, BIOL 480, Dept. of Biology, Western Carolina Univ.

2024 *Instructor of record*: Graduate Methods in Ecology and Evolution, BIOL 675, Dept. of Biology, Western Carolina Univ.

2024 *Instructor of record*: General Ecology, BIOL 304, Dept. of Biology, Western Carolina Univ.

2023 *Instructor of record*: Methods in Ecology and Evolution, BIOL 375, Dept. of Biology, Western Carolina Univ.

2023 *Instructor of record*: Undergraduate independent research, BIOL 480, Dept. of Biology, Western Carolina Univ.

2023 *Instructor of record*: Creative Inquiry Course, Dept. of Biological Sciences, Clemson

2022 *Instructor of record*: Creative Inquiry Course, Dept. of Biological Sciences, Clemson

2021 *Instructor of record*: Creative Inquiry Course, Dept. of Biological Sciences, Clemson

2020 *Instructor of record*: General Ecology, PCB 3043: lecture course for biology majors, FSU

2020 Successful proposal for summer course development TA line in FSU Dept. Biol Sci

2018 Succession and Disturbance, lecture for BIO 360, Ecology lecture, NCSU

2018 Biodiversity and Ecosystem Function, lecture for BIO 360, Ecology lecture, NCSU

2018 Population dynamics of *Tribolium castaneum*, lab unit developed for BIO 360, Ecology Lab, North Carolina State University

2018 Pollination Syndromes, lab unit developed for BIO 360, Ecology Lab, North Carolina State University

2018 Teaching assistant, BIO 360, Ecology Lab, North Carolina State University

2016 Teaching assistant, BIO 360, Ecology Lab, North Carolina State University

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2015-2016 Teaching assistant. BIO 460, Field Ecology & Methods, North Carolina State University

2014 Teaching assistant. Bio16, Ecology Lecture & Lab, Dartmouth College

GRADUATE STUDENTS

COMMITTEE MEMBER

2023-2024 Annastasia Wilson; K. Matthews Lab, Western Carolina University

READER

2024 Melissa Rogers; H. Coan Lab, Western Carolina University

UNDERGRADUATES MENTORED

2024 Johnny Brawley; post-bacc lab tech, western Carolina University

2024 Noah Olson; independent research student, Western Carolina University

2023-2024 Madison Lohwasser; independent research student, Western Carolina University

2022-2023 Taylor Sherer; Clemson Creative Inquiry student, Clemson University

2021-2022 Christopher Gaskins; Clemson Creative Inquiry student, Clemson University

2021-2022 Wyatt Witman; Clemson Creative Inquiry student, Clemson University

2019-2020 Catherine Lehman; Undergraduate Research Opportunity Program, Florida State University.

2019-2020 Sandra Miles; Undergraduate Research Opportunity Program, Florida State University.

2019 Joel Wharton; RA, Florida State University.

2019 Megha Patel; RA, Florida State University.

2017 Diana Jacobsmeyer; Seattle University, Seattle, WA.

2016 Trevor Anthony Ledbetter; University of Arizona, Tucson, AZ.

2015 Jisung Park; Kalamazoo College, Kalamazoo, MI

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2015 Heather Ellison; Pima Community College, Tucson, AZ

PRESENTATIONS

INVITED TALKS

2023 University of Tennessee Knoxville EEB Seminar, Knoxville, Tennessee
The chemical ecology of plant reproduction

2023 Western Carolina University Biology Seminar, Cullowhee, North Carolina
Flowers as strategies: Understanding floral traits in a multi-species context

2023 Sul Ross University Biology Seminar, Alpine, Texas
The chemical ecology of plant reproduction

2019 Florida State University Ecology and Evolution Seminar, Tallahassee, Florida
Flowers are strategies Understanding floral traits in a multi-species context

2019 Chicago Botanic Garden
Flowers are strategies Understanding floral traits in a multi-species context

2017 Duke Population Biology Seminar, Duke University, Durham, North Carolina
The Pollen-Reward Paradox (Heiling, J., Judith L. Bronstein, Rebecca E. Irwin)

CONTRIBUTED TALKS

2023 Ecological Society of America; Portland, Oregon
Differential floral warming along an elevation gradient is associated with divergence in gametic thermal optima (Heiling, J, and M. Koski)

2019 Guild of Rocky Mountain Ecologists and Evolutionary Biologists; Gothic, Colorado
Pollen rewards and the defense—attraction trade-off

2018 Ecological Society of America; New Orleans, Louisiana
When is nectar robbing a commensalism? (Heiling, J., T. A. Ledbetter, S. Richman, H. Ellison, J. L. Bronstein, R. E. Irwin)

2018 American Society of Naturalists meeting; Asilomar, California

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Balancing Costs and Benefits When a Gamete is Also a Pollinator Reward (Heiling, J., R. E. Irwin, W. F. Morris)

2017 Ecological Society of America annual meeting; Portland, Oregon
The Pollen-Reward Paradox (Heiling, J., J. L. Bronstein, R. E. Irwin)

POSTERS

2013 Evolution annual meeting; Divergence and reproductive isolation between two ecotypes of a native Texas perennial grass, *Panicum hallii* (J. M. Heiling, D. B. Lowry, and T. E. Juenger, University of Texas at Austin, Austin, TX)

2012 University of Texas Summer Research Scholars Program poster session;
Seed size variation in a Texas grass: Investigating a cline in *Panicum hallii* (J. M. Heiling, University of Texas at Austin, Austin, TX)

SERVICE

EDITORIAL BOARD MEMBERSHIP

Associate Editor, Journal of Pollination Ecology, 2020 – Present

COMMITTEE MEMBERSHIP

Florida State University, Department of Biological Science
Diversity Equity and Inclusion Committee
Feb. 2020 – Sept. 2020

American Society of Naturalists Graduate Student Council, Graduate Student Awards Committee, Sept. 2017 – Sept. 2019

PEER REVIEW

Ecology
Proceedings of the Royal Society B
New Phytologist
American Journal of Botany
Journal of Ecology
Annals of Botany
Functional Ecology
FLORA
Journal of Pollination Ecology
Naturwissenschaften

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OUTREACH

2017 Guest lecture – preparation of plant specimens for herbaria Youth Conservation Crops

2017 Letters to a Pre-Scientist, pen-pal <https://www.prescientist.org/>

2017 Planting Science, scientist mentor <https://www.plantingscience.org/>

2015 Public Talk- Upper Valley COOP, White River Junction, Vermont. “Brain Buzz!” lecture series, Title: What are mutualisms?

2015 Rocky Mountain Biological Laboratory Undergraduate Education Program, guest panelist.

2015 Rocky Mountain Biological Laboratory Kid’s Nature Camp, guest educator.

WORKSHOPS AND SHORT COURSES ATTENDED

2018 Volatile Analysis at RMBL – Workshop and Lab-to-Field Training Course, Instructors: Robert Raguso & Diane Campbell

2018 Inclusive and Accurate Approaches for Teaching Sex and Gender in Biology, ESA WK40, Instructors: Alex J. Webster & Ash T. Zemenick

RESEARCH BACKGROUND

January 2021-Present Postdoctoral fellow, Clemson University. Faculty mentor: Matthew Koski

May 2019-December 2020 Postdoctoral research and teaching scholar, Florida State University. Faculty Mentors: Nora Underwood & Brian Inouye.

2015-2019 Graduate research and teaching assistant, Dartmouth College and North Carolina State University. Advisor: Rebecca Irwin.

2014 Research assistant, Secondary nectar robbing in bumble bees. University of Arizona/Dartmouth College/Rocky Mountain Biological Laboratory. PIs: Judith Bronstein & Rebecca Irwin.

2013-2014 Research assistant, Landscape evolutionary genomics in *Panicum hallii*. University of Texas at Austin. PI: Thomas Juenger, Mentor: David Lowry.

2013 Research assistant, Landscape genetics in *Larix*: University of Montana Missoula. PI: Lila Fishman.

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2012-2013 Undergraduate research assistant, Landscape evolutionary genomics in *Panicum hallii*. PI: Thomas Juenger, Mentor: David Lowry.

2011-2012 Undergraduate research assistant, Phorid fly community ecology and dispersal dynamics. University of Texas at Austin, Fire Ant Lab. PIs: Lawrence Gilbert, Robert Plowes, Ed LeBrun.

2011 Field assistant, Sexual-signaling in *Gasterosteus aculeatus*. The University of Texas at Austin. PI: Daniel Bolnick.

2010-2011 Greenhouse manager/Undergraduate research assistant, Evolutionary ecology of *Heliconius* butterflies and host-plants. PI: Lawrence Gilbert.

2009 Field technician, Biological control of *Arundo donax* by *Tetramesa romana*. The University of Texas at Austin/USDA. PIs: Lawrence Gilbert & John Goolsby.

2009 Undergraduate research, Experimental evolution in *Tribolium castaneum*. The University of Texas at Austin. PI: Daniel Bolnick.