Seema Nayan Sheth

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Department of Plant and Microbial Biology
North Carolina State University
Raleigh, NC 27695

PROFESSIONAL APPOINTMENTS

Assistant Professor 2018 - present
Department of Plant and Microbial Biology
North Carolina State University

National Science Foundation Postdoctoral Fellow 2016 - 2017
Department of Integrative Biology Biology
University of California, Berkeley
Supporting scientists: Dr. David Ackerly and Dr. Bruce Baldwin

Postdoctoral Research Associate 2014 - 2015
Department of Ecology, Evolution, and Behavior
University of Minnesota
Advisor: Dr. Ruth Shaw

Research Scientist: Conservation, Ecology, and Evolution 2006 - 2008
Center for Conservation and Sustainable Development
Missouri Botanical Garden

EDUCATION

Ph.D., Ecology 2008 - 2014
Colorado State University
Advisor: Dr. Amy Angert

M.S., Biology (Ecology, Evolution, and Systematics) 2003 - 2006
University of Missouri - St. Louis
Advisor: Dr. Bette Loiselle

B.A., Environmental Sciences and Spanish (double major) 1998 - 2002
Washington University in St. Louis

PUBLICATIONS

20. **Sheth, S.N.**, N. Morueta-Holme, and A. L. Angert. Determinants of geographic range size in plants. In press, *New Phytologist*. https://doi.org/10.1111/nph.16406.

19. Briscoe Runquist, R. D., A. J. Gorton, J. B. Yoder, N. J. Deacon, J. J. Grossman, S. A. Kothari, M. P. Lyons, **S. N. Sheth**, P. Tiffin, and D. A. Moeller. 2020. Context dependence of local adaptation to abiotic and biotic environments: a quantitative and qualitative synthesis. In press, *American Naturalist*. https://doi.org/10.1086/707322.

18. Smithers, B. V., M. F. Oldfather, M. J. Koontz, J. Bishop, C. Bishop, J. Nachlinger, and **S. N. Sheth**. 2020. Community turnover by composition and climate affinity across scales in an alpine system. *American Journal of Botany*. https://doi.org/10.1002/ajb2.1376.

17. Oldfather, M. F., M. M. Kling, **S. N. Sheth**, N. C. Emery, and D. D. Ackerly. 2020. Range edges in heterogeneous landscapes: integrating geographic scale and climate complexity into range dynamics. *Global Change Biology*. https://doi.org/10.1111/gcb.14897.

16. Lowry D. B., J. M. Sobel, A. L. Angert, T-L. Ashman, R. L. Baker, B. K. Blackman, Y. Brandvain, K. J. R. P. Byers, A. M. Cooley, J. M. Coughlan, M. R. Dudash, C. B. Fenster,

K. G. Ferris, L. Fishman, J. Friedman, D. L. Grossenbacher, L. M. Holeski, C. T. Ivey, K. M. Kay, V. A. Koelling, N. J. Kooyers, C. J. Murren, C. D. Muir, T. C. Nelson, M. L. Peterson, J. R. Puzey, M. C. Rotter, J. R. Seeman, J. P. Sexton, **S. N. Sheth**, M. A. Streisfeld, A. L. Sweigart, A. D. Twyford, M. Vallejo-Marin, J. H. Willis, C. A. Wu, Y. W. Yuan. 2019. The case for the continued use of the genus name *Mimulus* for all monkeyflowers. *Taxon* 68: 617-623.

15. Kulbaba, M. W., **S. N. Sheth**, R. E. Pain, V. M. Eckhart, and R. G. Shaw. 2019. Additive genetic variance for lifetime fitness and the capacity for adaptation in the wild. *Evolution* 73: 1746-1758.

14. **Sheth, S. N.**, M. W. Kulbaba, R. E. Pain, and R. G. Shaw. 2018. Expression of additive genetic variance for fitness in a population of partridge pea in two field sites. *Evolution* 72: 2537-2545.

13. **Sheth, S. N.** and A. L. Angert. 2018. Demographic compensation does not rescue populations at a trailing range edge. *Proceedings of the National Academy of Sciences (USA)* 115: 2413-2418.

12. Pain, R. E., R. G. Shaw, and **S. N. Sheth**. 2018. Costs associated with N-fixing rhizobia early in the life of partridge pea *Chamaecrista fasciculata*. *American Journal of Botany* 105: 796-802.

11. Morueta-Holme, N., M. F. Oldfather, R. L. Olliff-Yang, A. P. Weitz, C. R. Levine, M. M. Kling, E. C. Riordan, C. Merow, **S. N. Sheth**, A. H. Thornhill, and D. D. Ackerly. 2018. The language of climate change: best practices in research and publication. *Nature Climate Change* 8: 92-94.

10. Angert, A. L., M. Bayly, **S. N. Sheth**, and J. R. Paul. 2018. Testing range-limit hypotheses using range-wide habitat suitability and occupancy for the scarlet monkeyflower (*Erythranthe cardinalis*). *American Naturalist* 191: E76-E89.

9. **Sheth, S. N.** and A. L. Angert. 2016. Artificial selection reveals high genetic variation in phenology at the trailing edge of a species range. *American Naturalist* 187: 182-193. (American Naturalist 2016 Student Paper Award)

8. **Sheth, S. N.**, I. Jiménez, and A. L. Angert. 2014. Identifying the paths leading to variation in geographical range size in western North American monkeyflowers. *Journal of Biogeography* 41: 2344-2356.

7. **Sheth, S. N.** and A. L. Angert. 2014. The evolution of environmental tolerance and range size: a comparison of geographically restricted and widespread *Mimulus*. *Evolution* 68: 2917-2931.

6. **Sheth, S. N.**, L. G. Lohmann, T. Distler, and I. Jiménez. 2012. Understanding bias in geographic range size estimates. *Global Ecology and Biogeography* 21: 732-742.

5. Paul, J. R., **S. N. Sheth**, and A. L. Angert. 2011. Quantifying the impact of gene flow on phenotype-environment mismatch: a demonstration with the scarlet monkeyflower *Mimulus cardinalis*. *American Naturalist* 178: S62-S79.

4. Angert, A. L., **S. N. Sheth**, and J. R. Paul. 2011. Incorporating population-level variation in thermal performance into predictions of geographic range shifts. *Integrative And Comparative Biology* 51: 733-750.

3. **Sheth, S. N.**, B. A. Loiselle, and J. G. Blake. 2009. Phylogenetic constraints on fine-scale patterns of habitat use by eight primate species in eastern Ecuador. *Journal of Tropical Ecology* 25: 571-582.

2. **Sheth, S. N.**, L. G. Lohmann, T. Consiglio, and I. Jiménez. 2008. Effects of detectability on estimates of geographic range size in Bignonieae. *Conservation Biology* 22: 200-211.

1. Amend, J. P., D. A. R. Meyer-Dombard, **S. N. Sheth**, N. Zolotova, and A. C. Amend. 2003. *Palaeococcus helgesonii* sp. nov., a facultatively anaerobic, hyperthermophilic archaeon from a geothermal well on Vulcano Island, Italy. *Archives of Microbiology* 179: 394-401.

GRANTS, FELLOWSHIPS, AND AWARDS

NCSU Faculty Research and Professional Development Fund, $5,000 2019 - 2020
Rapid evolution of thermal tolerance across a species' geographic range (PI)

American Naturalist 2016 Student Paper Award 2017

NSF Postdoctoral Research Fellowship in Biology, $138,000 2016 - 2017
Relationships among climatic tolerance, trait evolution, and diversification in the California flora

Postdoctoral Association Career Development Award, Univ. of Minnesota, $400 2015

Finalist, University of California President's Postdoctoral Fellowship 2014

NSF DEB Evolutionary Ecology, $14,984 2012 - 2014
Dissertation Research: Role of evolutionary potential in limiting distributions (co-PI)

Outreach Grant, Society for the Study of Evolution, $800 2012

Global Sustainability Leadership Fellow, Colorado State University 2012

Rosemary Grant Award, Society for the Study of Evolution, $2,500 2010

Graduate Student Research Award, Botanical Society of America, $500 2010

Finalist, Environmental Protection Agency STAR Graduate Fellowship 2009

Steinkamp Fund, Colorado Native Plant Society, $1,000 2009

Women in Natural Sciences Travel Grant, Colorado State University, $300 2009

Awards from Department of Biology, Colorado State University, $7,425 2009 - 2014

Grad. Degree Program in Ecology Fellowship, Colorado State University, $1,000 2008

NSF GK-12 Fellowship, Colorado State University, $4,000 2008

NSF GK-12 Fellowship, Univ. of Missouri-St. Louis, $30,000 2005 - 2006

Awards from Department of Biology, Univ. of Missouri-St. Louis, $3,500 2004 - 2005

Primate Action Fund, Conservation International, $3,000 2004

PRESENTATIONS

Invited symposia

International Biogeography Society Humboldt-250 Meeting, Quito, Ecuador 2019

Symposium: Architects of variation: How climate and physiology shape patterns of biodiversity

"Can plant thermal tolerance evolve under climate change? A comparison of central and edge populations" (R. Wooliver, S. Tittes, and **S.N. Sheth**; presented by R. Wooliver)

Green Life Sciences, University of Michigan, Ann Arbor, MI 2018

Symposium: Plant-environment interactions across scales

"Do demographic compensation and adaptation buffer species from changing climate?"

Society for the Study of Evolution, Portland, OR 2017

American Society of Naturalists Symposium: Across the Nth dimension: Quantitative and conceptual advances in the study of niche breadth

"Does niche breadth predict vulnerability to changing environments? From population-level traits and demography to diversification in deep time"

SACNAS, Long Beach, CA 2016

Scientific Symposium: (Day and) Night at the Museum: Exploring Research in Ecology and Evolution Behind the Scenes of Natural History Museums

"Harnessing the power of herbarium specimen data for ecological and evolutionary studies"

Jornadas Argentinas de Botanica, Corrientes, Argentina 2007

Symposium: Conservation and Threat Assessments of Plants

"Riesgo de extinción en Bignonieae (Bignoniaceae): una perspectiva filogenética" (**Sheth, S.N.**, L.G. Lohmann, T. Consiglio, and I. Jiménez)

Botanical Society of America and Plant Biology Joint Congress, Chicago, IL 2007

Colloquium: Integration of spatial and ecological data in evolutionary studies

"Extinction risk in Bignonieae (Bignoniaceae): a phylogenetic perspective" (**Sheth, S.N.**, L.G. Lohmann, T. Consiglio, and I. Jiménez)

Invited seminars

Department of Integrative Biology, University of California, Berkeley (upcoming) 2020
Department of Ecology and Evolutionary Biology, University of Arizona (upcoming) 2020
Department of Ecology and Evolutionary Biology, Michigan State University (upcoming) 2020
Department of Ecology and Evolutionary Biology, University of Colorado (upcoming) 2020
Department of Ecology and Evolutionary Biology, Tulane University 2019
Program in Ecology, Duke University 2019
Kellogg Biological Station, Michigan State University 2019
Genetics and Genomics Seminar Series, North Carolina State University 2019
Bio-Pop Seminar Series, Department of Biology, University of North Carolina 2018
Department of Plant Biology, University of Vermont 2018
EEBio Seminar Series, Department of Biology, University of Virginia 2018
Department of Forestry and Environmental Resources, North Carolina State University 2018
Department of Biological Sciences, California Polytechnic State University 2017

Department of Ecology and Evolutionary Biology, University of California, Los Angeles 2017
Environmental Systems Graduate Group, University of California, Merced 2017
School of Integrative Plant Science, Plant Biology Section, Cornell University 2017
Center for Population Biology, University of California, Davis 2017
Department of Biology, University of Utah 2017
Natural History Museum of Utah 2017
Department of Plant and Microbial Biology, North Carolina State University 2017
Department of Biology, Williams College 2016
Department of Biology, University of San Francisco 2016
Department of Biology, Grinnell College 2015
Department of Plant Biology, University of Minnesota 2015
Department of Biology, Washington University in St. Louis 2007
Department of Biology, St. Louis University 2007

Contributed conference presentations

Kulbaba, M., **S.N. Sheth**, R.E. Pain, V.M. Eckhart, and R.G. Shaw. "Adaptive potential and realized changes in fitness in natural populations." Society for the Study of Evolution, Montpellier, France (poster) 2018

Sheth, S.N. and A.L. Angert. "Demographic compensation does not rescue *Erythranthe cardinalis* populations at the southern edge of the species range." Ecological Society of America, Portland, OR 2017

Kulbaba, M., R.E. Pain, V.M. Eckhart, **S.N. Sheth**, and R.G. Shaw. "The immediate capacity for adaptation and its realization in natural plant populations." International Botanical Congress, Shenzhen, China 2017

Sheth, S.N., M. Kulbaba, R.E. Pain, and R.G. Shaw. "Expression of additive genetic variance for fitness in a population of partridge pea grown in two field sites." Society for the Study of Evolution, Portland, OR (presented by R.G. Shaw) 2017

Sheth, S.N., W.A. Freyman, B.G. Baldwin, and D.D. Ackerly. "Relationships among rates of climatic niche evolution and diversification." Society for the Study of Evolution, Austin, TX (poster) 2016

Sheth, S.N. and A.L. Angert. "Artificial selection reveals high genetic variation in phenology at the trailing edge of a species range." Ecological Society of America, Baltimore, MD 2015

Sheth, S.N. and A.L. Angert. "Does a jack-of-all-temperatures have a large geographic range?" Society for the Study of Evolution, Snowbird, UT 2013

Sheth, S.N., I. Jiménez, and A.L. Angert. "Effects of niche properties on variation in geographic range size among species of western North American monkeyflowers." Ecological Society of America, Portland, OR 2012

Sheth, S.N., L.G. Lohmann, T. Distler, and I. Jiménez. "The Wallacean shortfall: bias in estimates of geographic range size." Botanical Society of America, St. Louis, MO (presented by I. Jiménez) 2011

Sheth, S.N. and A.L. Angert. "Ecological niche attributes and geographic range size in western North American monkeyflowers." Society for the Study of Evolution, Portland, OR 2010

Sheth, S.N., L.G. Lohmann, I. Jiménez, and T. Consiglio. "Riesgo de extinción en Bignonieae (Bignoniaceae) estimado con datos de herbario." Congreso Latinoamericano de Botánica. Santo Domingo, Dominican Republic (presented by L. G. Lohmann) 2006

TEACHING

North Carolina State University

Plant Ecology, PB495/595-003, solo instructor — 2019 - present

Colorado State University

Principles of Plant Biology Laboratory, teaching assistant — 2008 - 2014
Plant Ecology, guest lecturer — 2012 - 2013
Plant Ecology, teaching assistant — 2011 - 2012
Biology of Organisms, guest lecturer — 2009
Cache La Poudre Junior High School, NSF GK-12 fellow, LaPorte, CO — 2008 - 2009

Missouri Botanical Garden

Neotropical Plant Families, guest lecturer for University of Michigan course — 2008
Conservation Biology, guest lecturer for University of Missouri - St. Louis course — 2008

University of Missouri - St. Louis

McCluer High School, NSF GK-12 fellow, Florissant, MO — 2005 - 2006
Organisms and th Environment Laboratory, guest lecturer — 2005

AmeriCorps Partnership for Youth

Woodward Elementary School, tutor and teaching assistant, St. Louis, MO — 2002 - 2003

MENTORING

North Carolina State University

Postdoctoral associates

Dr. Rachel Wooliver — 2018 - present

Graduate students

Aleah Querns (M.S.) — 2018 - present
Emma Vtipil (M.R.) — 2019 - present

Undergraduate researchers

Brooke Caldwell — 2019 - present
Natalie Gold — 2019
Mariah Kidd — 2019 - present
Daisy Ryan — 2020 - present
Jessie Torres — 2018 - 2019
Emma Vtipil (Honor's thesis student; recipient of NCSU Chilton Research Award) — 2018 - 2019
Mia Wiegmann — 2018 - present
Collin Yurish — 2018 - 2019

Graduate student committees

Samuel Flake — 2018 - present
Simon Pinilla-Gallego — 2018 - present
Greg Wilson — 2018 - 2019

University of California, Berkeley

Mentored 7th graders at King Middle School as part of Be a Scientist outreach program — 2017

University of Minnesota

Sam Weaver (NSF REU student from St. Olaf College) — 2015

Colorado State University

Amber Weimer (Honor's thesis undergraduate student)	2013 - 2014
Trained, mentored, and supervised 17 undergraduates & recent college graduates	2009 - 2014
Biological Summer Undergraduate Research Experience program committee member	2012

SERVICE

University service

Ecology faculty search committee, Dept. of Plant and Microbial Biology, NCSU	2019 - 2020
College of Agricultural and Life Sciences greenhouse committee, NCSU	2019 - present
Plant Biology Graduate admissions committee, NCSU	2018 - present
Biology faculty search committee, Colorado State University	2012 - 2013

Professional service

Manuscript reviewer: *American Journal of Botany, American Naturalist, Annals of Botany, AoB PLANTS, BMC Evolutionary Biology, Ecography, Ecological Applications, Ecology, Ecology Letters, Evolution, Evolutionary Ecology, Functional Ecology, Journal of Animal Ecology, Journal of Ecology, Molecular Ecology, New Phytologist, Science Advances*	2009 - present
Hamilton student award committee member, Society for the Study of Evolution	2020 - present
Book proposal reviewer: Oxford University Press	2018
Proposal reviewer: NSF DEB, Population and Community Ecology	2014

Other service

Volunteer: Global Observation Research Initiative in Alpine Environments (GLORIA), White Mountains Wilderness, California	2017 - present
Exhibitor, Darwin Day, North Carolina Museum of Natural Sciences	2019
Advisory board member: Science Ambassador Scholarship (for undergraduate women in science, technology, engineering, or math), Cards Against Humanity	2017 - 2018
Collaborated with National Park Service to recruit Navajo Nation students to assist with fieldwork in Canyon de Chelly National Monument, AZ	2009
Volunteer, Putnam Elementary Science Carnival, Fort Collins, CO	2009
Volunteer, Unidad Técnica (environmental NGO), Managua, Nicaragua	2001

WORKING GROUPS AND WORKSHOPS

Agricultural Leadership Learning Institute for Faculty, North Carolina State University, Raleigh, NC — 2019

Evolution in Changing Seas Synthesis Workshop, Shoals Marine Laboratory, Appledore, ME — 2019

Software Carpentry Workshop, Berkeley Institute of Data Sciences, Berkeley, CA — 2016

Early Career Centennial Mentoring Program, Ecological Society of America, Baltimore, MD — 2015

Quantitative Genetics and Mixed Models in Quantitative Genetics, Summer Institute in Statistical Genetics, University of Washington, Seattle, WA — 2013

Intro to Python for ArcGIS Workshop, Colorado State University, Fort Collins, CO — 2016

Science Communication Workshop, Colorado State University, Fort Collins, CO — 2012

Living on the edge: integrating science into the management of range-margin populations, University of Wyoming, Laramie, WY — 2010

Applied Phylogenetics Workshop, Bodega Bay Marine Laboratory, CA — 2010

Working with ArcGIS Spatial Analyst (short course), Environmental Systems Research Institute, St. Charles, MO — 2007

Distance Sampling Workshop, University of Missouri - St. Louis, St. Louis, MO — 2006

Assessing extinction risk in Bignonieae (summer internship), Center for Conservation and Sustainable Development, Missouri Botanical Garden, St. Louis, MO — 2005

Geographic Information Systems (course), University of Missouri - St. Louis — 2004

Tropical Biology: An Ecological Approach (course), Organization for Tropical Studies, Costa Rica — 2004

Historical Biogeography (short course), University of Missouri - St. Louis — 2004

PROFESSIONAL AFFILIATIONS AND SOCIETIES

Science Director: GLORIA (Global Observation Research Initiative in Alpine Environments) Great Basin

Faculty Affiliate: Southeast Climate Science Center

American Society of Naturalists

Botanical Society of America

Ecological Society of America

Society for the Study of Evolution

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