CURRICULUM VITAE

Michael C. Rotter
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PROFESSIONAL APPOINTMENTS

2020 – Present Assistant Professor, Department of Biology, Utah Valley University, Orem, UT
2019 – 2020 Visiting Assistant Professor, Department of Biology, Manchester University, North Manchester, IN

EDUCATION

PhD, Biology (2019)
Northern Arizona University, Flagstaff, AZ
Dissertation title: The Evolutionary Ecology of Herbivore Resistance Traits in Monkeyflower

Master of Science, Biology (2014)
Northern Michigan University, Marquette, MI
Thesis title: Plant Community Development of Isle Royale's Moose-Spruce Savannas

Bachelor of Science, Botany (2008)
Northern Michigan University, Marquette, MI

RESEARCH INTERESTS

Invasion ecology
Evolutionary ecology
Plant-animal interactions

PUBLICATIONS

Hochstetler[+], G.L., Jackson[+] A. L., Durden[+], K.D., and **Rotter, M.C.** *In Review.* Manchester University's Plant Collection: An important plant collection of northeastern Indiana. The Great Lakes Botanist.

Rotter, M.C. *In Press.* An annotated checklist of the herbivores and seed predators of *Mimulus guttatus.* Natural History.

Vallejo-Marín, M., Friedman, J., Twyford, A.D., Lepais, O., Ickert-Bond, S.M., Streisfeld, M.A., Yant, L., van Kleunen, M, **Rotter, M.C**. and Puzey, J.R., 2020. Population genomic and historical analysis reveals a global invasion by bridgehead processes in Mimulus guttatus. Biology Communications.

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

Rotter, M.C., M. Vallejo-Marın, and L.M. Holeski. 2019. A test of the evolution of increased competitive ability in two invaded regions. *Evolutionary Ecology* 33: 713-735

Rotter, M.C. [1]**,** J.J. Couture, E.M. Rothwell, J. Garcia [+], and L.M. Holeski. 2018. Evolutionary ecology of plant resistance traits across the herbivore diet spectrum: A test in the model plant *Mimulus guttatus. Evolutionary Ecology Research* 19: 423-440

Rotter, M.C. 2018. Noteworthy collection: *Petasites hybridus*. *The Great Lakes Botanist* 57:45-48

Rotter, M.C. and L. M. Holeski. 2018. A meta-analysis of the evolution of increased competitive ability hypothesis: Genetic-based trait variation and trade-offs. *Biological Invasions* 20:2647-2660

Rotter, M.C. and L. M. Holeski. 2017. The Lepidopteran herbivores of the model plant *Mimulus guttatus*. *Journal of the Lepidopterists' Society* 71:162-168.

Mydlowski [+,2], E.A. and **M.C. Rotter.** 2017. A note on mucilage and herbivore damage on *Brasenia schreberi* in a northern Michigan lake. *The Great Lakes Botanist* 56: 45-51.

Rotter, M.C. and R.M. Strand. 2016. The biogeography of a disjunct plant-insect relationship: Thimbleberry and *Diastrophus kincaidii* (Hymenoptera: Cynipidae) in the Great Lakes region. *Great Lakes Entomologist* 49: 7-17.

Rotter, M.C. and A.J. Rebertus. 2015. Plant community development of Isle Royale's moose - spruce savannas. *Botany* 93: 75-90.

Rotter, M.C., S.E. Fawcett, and D.R. McConnell. 2012. Noteworthy collection: *Asplenium rhiziphylum. The Michigan Botanist* 51: 82-84.

Rotter, M.C. 2010. A preliminary list of the lichen flora of the San Francisco Presidio. *Bulletin of the California Lichen Society* 17: 23-26.

(+ indicates undergraduate mentored)

[1] 2019 Northern Arizona University, Department of Biological Sciences Outstanding Paper.
[2] Isobel Dickinson Award for best student authored paper (Great Lakes Botanist volume 56).

Technical Reports and Other Publications *([+] indicates undergraduate mentored)*

Rotter, M.C. 2017. Book Review: Monarchs and Milkweed: A migrating butterfly, a poisonous plant, and their remarkable story of coevolution. Anurag Agrawal. The Great Lakes Botanist. 56: 239-240

Mydlowski E.A. [+] and **M.C. Rotter.** 2016. Insect herbivores and plant defenses of *Brasenia schreberi* in northern Michigan. Newsletter of the Michigan Entomological Society.

Rotter, M.C. 2014. Plant community development of Isle Royale's moose spruce savannas. Master's thesis. Northern Michigan University, Marquette MI.

Rotter, M.C. and A.J. Greaff [+]. 2013. McClellan mitigation wetland plant survey and mitigation monitoring. Wetland monitoring report. Prepared for the city of Marquette Michigan and the Michigan Department of Environmental Quality (Lansing, MI).

Rotter, M.C. 2013. Flora and floristic quality rankings of the Longyear Timber Company holdings on the Yellow Dog Plains, Marquette County Michigan. Prepared for the Yellow Dog Watershed Preserve (Big Bay, MI).

Grants, Fellowships, and Scholarships

2018 Dr. James Rominger Botany Scholarship (NAU) ($600)
2018 Kerry Henrickson Teaching Scholarship (NAU) ($600)
2017 NAU Graduate Student Government Travel Grant ($450)
2017 Johnson Ecology Scholarship (NAU) ($949)
2017 Gordon Research Conference: Plant/ Herbivore Interactions, Graduate Support ($750)
2017 NAU Graduate Student Government Travel Grant ($450)
2014-2016 Genes to Environment Fellowship, Northern Arizona University ($60,000)
2016 Jerry O. Wolff Student Enrichment Scholarship (NAU) ($2000)
2016 Utah Native Plant Society ($500)
2016 Idaho Native Plant Society ($100)
2015 Michigan Botanical Foundation Grant ($1000)
2012 Excellence in education research grant ($5000) Northern Michigan University

<u>Invited Presentations and Lectures</u>

2019 Eating Away Invasive Species. March for Science Outreach Mini-talk Series. Flagstaff, Arizona.
2018 Ecology in an urban watershed: opportunities and management issues. Guided tour of the Rio de Flag. Friends of the Rio de Flag, Flagstaff, Arizona
2017 From *Mimulus* to *Erythranthe*: The changing names of monkey flowers and why it matters. Arizona Native Plant Society, Flagstaff, Arizona.

2017 Little mouths with big impacts: Herbivore ecology in northern Arizona. Field trip leader. Arizona Native Plant Society, Flagstaff, Arizona.
2015 Evolutionary ecology across the landscape: plants and insects, invited seminar, Department of Biology Seminar Series. Northern Michigan University, Marquette, Michigan.
2014 Plant and animal relationships, field trip leader. Michigan Botany Club spring foray, Houghton, Michigan.
2014 The biogeography of a disjunct plant and its obligate Cynipid wasp in the Great Lakes Region, invited talk. Tri-Beta biological honors society (Northern Michigan University Chapter), Marquette, Michigan.
2013 The evolution and biogeography of Michigan's Upper Peninsula flora. Invited talk, Celebration of the Upper Peninsula, Upper Peninsula Environmental Coalition, Marquette, Michigan.
2009 Promoting a student led research natural area. Michigan Student Sustainability Coalition, Grand Rapids, Michigan.

Presentations at Professional Conferences

2019 The evolution of increased competitive ability between two plant invasions. Entomology Society of America Conference. St. Louis, Missouri.
2017 Plant resistance traits against specialist and generalist herbivores within the model organism *Mimulus guttatus.* Entomology Society of American Conference. Denver, Colorado. USA.

Poster Presentations

2018 Rasmussen, G.R.M.*, K.C. Tumbagahan*, **M.C. Rotter**, and L.M. Holeski. Physical defense traits in native and non-native populations of yellow monkeyflower. Northern Arizona University Undergraduate Symposium. Flagstaff, Arizona.
2018 Fulbright, K.*, **M.C. Rotter**, and L.M. Holeski. Can Phytochemistry of an Invasive Species be predicted by Novel Weapons or the Enemy Release Hypotheses? Northern Arizona University Undergraduate Symposium. Flagstaff, Arizona.
2017 Marcoly, S.*, **M.C. Rotter,** and L. M. Holeski. Does presence of mustards increase the chances of herbivory on monkey flower? A natural test of associational susceptibility. Northern Arizona University Undergraduate Symposium. Flagstaff, Arizona.
2017 **Rotter, M.C**., J.J. Couture, J. Garcia*, and L.M. Holeski. Defense traits against specialist and generalist herbivores within the model organism *Mimulus guttatus.* Gordon Research Conference: Plant- Herbivore interactions. Ventura, California.
2015 Garcia, J.*, **M.C. Rotter**, and L.M. Holeski. Effects of *Mimulus guttatus* physical and chemical defense traits on generalist and specialist herbivores. Northern Arizona University Undergraduate Symposium. Flagstaff, Arizona.
2015 Mydlowski E.A.* and **M.C. Rotter** Leaf size, mucilage and herbivore damage in Schrebers's watershield, *Brasenia schreberi,* in northern Michigan. Midwest Ecology and Evolution Conference, Indianapolis Indiana.
2007 **Rotter M.C.** and E. A. Wessels. Northern Michigan University's native plant study area. Making a Great Lake Superior Conference, Duluth, Minnesota.

*These authors are undergraduates from under-represented groups that I mentored.

TEACHING AND MENTORING

Courses Taught and Assisted

Utah Valley University

BOT 4100 Plant Anatomy* - Upper division botany course. Skill based labs based on independent projects and investigation. Students learn to grow and section plants as well as review current literature on topics of anatomical importance.

BOT 2400 Plant Kingdom*- Fully online course giving a basic introduction to botany.

BOT 2050 Field Botany* - Field course for majors and non-majors. Introduces student to the study of local flora and the identification of plants. Includes talks on common methods and sampling as well as careers in botany.

BIOL 1610 Introduction to Biology – Introductory courses designed to touch on principles of biological processes. Taught both as an in-person hybrid course and an online asynchronous course.

BIOL 1010 General Biology- Biology for non-majors emplacing the role of biology in society. Large lecture with over 80 students.

Manchester University

BIOL 241 Vascular Plant Systematics* - Field and lab based course designed to introduce students to plant collections, field based identification of local flora, and major evolutionary organization of plant diversity.

BIOL 106 Introduction to Biology* - Introductory course and lab aimed at discussing the philosophy of science, principle concepts in biology, and organismal diversity.

ENVS 106 Introduction to Environmental Sciences* – Introductory course aimed at exploring current issues in environmental management and how management can incorporate science into these issues through hands on study of a local environmental issue.

Northern Arizona University

BIO 326 Ecology – Designed course assignments, exams, and lectures for a 75-student course.

BIO 326L Ecology Lab* – Coordinated student independent projects and developed hands on lab activities on ecological sampling, statistics and study design.

BIO 305W Writing in Ecology* – Managed ecology labs in addition to teaching writing skills. I was awarded the outstanding biology teaching assistant in part for re-structuring this course and improving student writing outcomes.

Guest Lectures – Large lecture courses (70+ students) such as Ecology (Interspecific Variation), Genetics and Evolution (Heritability and Pedigrees).

Northern Michigan University

BIO 109L Anatomy and Physiology lab.

BIO 305 Ecology of the Northern Forest lab* – Upper division course for non-biology majors with field-based labs that I designed for an introduction to local ecology.

BIO 426 Ornithology lab* – Upper division and graduate level students with a field-based course focused on methods for studying avian ecology where I designed several labs focused on behavior and point counts.

BIO 435 Herpetology lab* – Upper division course focused on life history and ecology of Great Lakes region reptiles and amphibians. I designed the entire lab incorporating preserved specimens and live animal observation.

BIO 450 Boreal Flora Assistant Instructor – Field based course where I helped with logistics and choosing sites for the course. I also helped students with study sessions and leading field trips on specific plant related topics (graminoids, plant-insect interactions, bryophytes and lichens).

Guest Lectures – Intro to biology (Gymnosperms), Ecology of the Northern Forest (Herbivores and Ecosystems), Ornithology (Avian Community Ecology).

*****Designed curriculum and/or course work for these sections.

Student Mentoring

Undergraduate Students

I have mentored 15+ undergraduates within my research labs during my time as a masters and PhD student.

The majority of these students have been female, first generation college students, or from under-represented groups.

Specific projects overseen have spanned from ethnobotany, chemical ecology, community ecology, mollusk and large animal herbivory, and plant herbivore defenses.

Two of my undergraduate mentees have been co-authors on research papers including the winner of the Isobel Dickinson Award for best student authored paper (Great Lakes Botanist volume 56).

AWARDS

Best Graduate Authored Paper of the Year for the Department of Biological Sciences, Northern Arizona University, 2019

Outstanding Graduate Teaching Assistant in Biological Sciences, Northern Arizona University, 2018

Outstanding Biology Graduate Student, Northern Michigan University, 2015

SERVICE AND LEADERSHIP

Reviewer for Academic Journals

Western North American Naturalist (Associate Editor)
The Great Lakes Botanist (Editorial Board)
Natural Areas Journal
Plant Ecology
Functional Ecology
Ecosphere
Biological Invasions
Evolutionary Ecology

Outreach Activities

Wasatch STEM fair judge, Provo Utah Public Middle School science fair

Guest radio-host on Sunnyside Radio KSZN-LP 101.5 FM, featuring songs about insects and plants and the biology behind them.

Virtual laboratory tours of Holeski Research Lab to primary school classes

Flagstaff STEM festival evolution booth

NAU undergrad research symposium judge

Other Positions

Herbarium curator, Manchester University, 2019-2020
Herbarium coordinator, Northern Michigan University 2012-2014
Biology Graduate Student representative to the Northern Michigan University student government, 2013-2014

PROFESSIONAL AND ACADEMIC MEMBERSHIPS

Michigan Botanical Club
Utah Native Plant Society
Entomological Society of America
California Botanical Society

PROFESSIONAL POSITIONS

Golden Gate National Parks Conservancy
Presidio Native Plant Nursery Intern
February 2009-December 2009

- Managed and facilitated volunteer programs.
- Worked on facility maintenance of nursery structures.
- Collected and propagated native plant species of the San Francisco Bay Area.

National Park Service, Natchez Trace Parkway and Indiana Dunes National Lakeshore
Fire Effects Monitor
January 2010- September 2011

- Monitored impacts of prescribed fires on flora and fauna in a variety of National Parks throughout the Southeast and Midwest.
- Assisted with both prescribed fire operations and fire suppression operations.
- Managed and collected data for a variety of projects and assessments.
- Developed and maintained a working herbarium.
- Resource Advisor during the 2010 Gulf Oil Spill monitoring rare bird species

Independent Contract Botanist
January 2006 - July 2014

- Successfully bid on botanical contracts with the United States Forest Service, University of Minnesota, United States Environmental Protection Agency, as well as numerous non-profits.
- Performed botanical surveys, invasive species removal, green house management, restoration work and public outreach.
- Worked independently to complete specific goals in remote and often inclement weather conditions.
- Completed agency reports, managed data and specimens for preservation, statistically analyzed field data. Presented findings and management suggestions based on field work

Northern Michigan University Biology Department
Research Assistant
May 2008-August 2008

- Assisted in research of rare orchid populations in Pictured Rocks National Lakeshore.
- Identified vascular plants and bryophytes including collecting reference specimens.

- Performed vegetation surveys and sampling both independently and with fellow researchers.

Northern Michigan University Geography Department
Native Plant Study Area Botanist
January 2007- May 2008

- Selected plant species and propagation methods for various different eco-systems.
- Supervised workers and volunteers.
- Created monitoring protocols for data collection of invertebrates, vertebrates, and vegetation.

REFERENCES

Dr. Liza Holeski, PhD Advisor, Northern Arizona University, Liza.Holeski@nau.edu, 928-523-0701
Dr. Amy Whipple, Teaching Mentor, Northern Arizona University, Amy.Whipple@nau.edu, 928-523-8727
Dr. Alan Rebertus, Masters Advisor, Northern Michigan University, arebertu@nmu.edu, 906-227-2351