

RACHEL M. GERMAIN

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ACADEMIC APPOINTMENTS

- Current **Assistant Professor, Dept. Zoology, University of British Columbia**
- 2019 **Postdoctoral Fellow, Dept. Botany/Zoology, University of British Columbia**
Funding: Killam Postdoctoral Fellowship/Biodiversity Postdoctoral Fellowship

EDUCATION



PhD in Ecology & Evolutionary Biology, University of Toronto

Thesis title: “Historical contingencies in the ecology and evolution of species diversity”

Committee: Benjamin Gilbert (advisor), Jason Weir, and John Stinchcombe



BSc Honors in Ecology, University of Guelph

Thesis topics: evolution of maternal effects¹ and niche/neutral ecology²

Advisors: ¹Christina Caruso, ¹Hafiz Maherali, and ²Andrew MacDougall

PUBLICATIONS

1. **Germain RM**, NT Jones, TN Grainger. In press. Cryptic dispersal networks connect habitat patches in ways not captured by distance. *Ecology*.
2. Guzman LM, **RM Germain***, C Forbes, S Straus, MI O'Connor, D Gravel, DS Srivastava, PL Thompson* (2018) A multi-trophic extension to metacommunity ecology. *Ecology Letters* 22: 19-33. * = contributed equally, F1000 recommended
3. **Germain RM**, MM Mayfield, B Gilbert (2018) Habitat filtering & coexistence across resource environments. *Biology Letters* 14: 20180460
4. **Germain RM**, TN Grainger, NT Jones, B Gilbert (2018) Maternal provisioning is structured by species' competitive neighborhoods. *Oikos* 0:1-9.
5. **Germain RM**, J Williams, D Schluter, A Angert (2018) Moving character displacement beyond characters using contemporary coexistence theory. *Trends in Ecology & Evolution*, 33, 74-84.

6. **Germain RM**, SY Strauss, B Gilbert (2017) Experimental dispersal reveals characteristic scales of biodiversity in a natural landscape. *Proceedings of the National Academy of Sciences* 114: 4447-4452.
Recipient of a Mercer award by the Ecological Society of America
7. Grainger, TN, **RM Germain**, NT Jones, B Gilbert (2017) Predation modifies biogeographic constraints in an insect metacommunity. *Ecology* 98: 851-860.
8. **Germain RM**, JT Weir, B Gilbert (2016) Species coexistence: macroevolutionary relationships and the contingency of historical interactions. *Proceedings of the Royal Society B* 283: 20160047.
9. Jones NT, **RM Germain**, TN Grainger, A Hall, L Baldwin, B Gilbert (2015) Dispersal mode mediates the effect of patch size and patch connectivity on metacommunity diversity. *Journal of Ecology* 103: 935-944.
10. **Germain RM**, B Gilbert (2014) Hidden responses to environmental variation: maternal effects reveal species niche dimensions. *Ecology Letters* 17: 662-669.
11. **Germain RM**, L Johnson, S Schneider, K Cottenie, E Gillis, AS MacDougall (2013) Spatial variability in seed predation determines the strength of stochasticity during community assembly. *American Naturalist* 182:169-179.
12. **Germain RM**, CM Caruso, H Maherali (2013) Mechanisms and consequences of parental effects in an invasive annual grass. *The International Journal of Plant Sciences* 171:960-971.

Manuscripts submitted or in review

underlined = lab member paper

1. Van Allen B, N Jones, K Carscadden, B Gilbert, **RM Germain***. Maternal effects and the outcome of competition. (in revision, *American Naturalist*) * = corresponding author
2. Hargreaves, A, **RM Germain**, M Bontrager, J Persi, A Angert. Biotic interactions affect fitness across latitudes, but only drive local adaptation in the tropics. (resubmitted with revisions, *American Naturalist*)
3. Blackford C, **RM Germain**, B Gilbert. An experimental manipulation of species' phenologies overturns competitive hierarchies. (in revision, *American Naturalist*)
4. **Germain RM**, DS Srivastava, A Angert. Evolutionary rescue in face of biological invasion. (resubmitted with revisions, *Nature Ecology & Evolution*)
5. Gonzalez A, **Germain RM**, Srivastava D, Filotas E, Dee L, Gravel D, O'Connor MI, Thompson P, Cowles J, Isbell F, Kefi S, Montoya J, Zelnick Y, Loreau M. Scaling-up biodiversity-ecosystem functioning research. (in revision, *Ecology Letters*)

6. Slimon K, **Germain RM**. Environmental variability and the evolution of bet hedging strategies. (in review, *Evolution*)

Book Review

“Metacommunity Ecology” in the *The Quarterly Review of Biology* 94(1):92-92 – led by D. Srivastava

RESEARCH GRANTS/SCHOLARSHIPS

- 2020 – UBC working group grant funds for “An empiricists’ guide to ecological theory” with T. Grainger: **\$20,000**
- 2019 – “The ecology and evolution of biodiversity in natural metacommunities”. NSERC Discovery Grant: **\$38,000/year x 5 years + \$12500 supplement**
- 2018 – UBC working group grant funds for “The role of evolution in shaping species coexistence across time scales”: **\$30,000**
- 2017 – UBC working group grant funds for “Trophic metacommunities” with M. I. O’Connor and D. Srivastava: **\$25,000**
- 2016 – Biodiversity Postdoctoral Fellowship, University of British Columbia (\$69,000 accepted): **\$110,000**
- 2016 – Killam Postdoctoral Fellowship, University of British Columbia: **\$104,000**
- 2014 – NSERC CGS-D Alexander Graham Bell, University of Toronto: **\$70,000**
- 2013 – Michael Smith Foreign Study Supplement, NSERC: **\$6000**
- 2012 – NSERC CGS-M Alexander Graham Bell, University of Toronto: **\$17,500**
- 2012 – Ontario Graduate Scholarship, University of Toronto (Declined): **\$15,000**
- 2010 – NSERC Undergraduate Student Research Award, University of Guelph: **\$4500**

AWARDS AND RECOGNITION

- 2019 – Dean’s pool merit award, Faculty of Science, UBC: **\$2000**
- 2019 – SSE New Faculty Profile: [link](#)
- 2018 – Jasper Loftus-Hills Young Investigator Award, American Society of Naturalists: **\$1700**
- 2018 – George Mercer Award for outstanding ecological research paper, Ecological Society of America: **\$1700**
- 2016 – Excellence in Doctoral Research, Canadian Society for Ecology & Evolution: **\$750**

- 2016 – Invitation to speak at prestigious Early Career Scientists Symposium in Ann Arbor, Michigan
- 2015 – Runner-up for Ramsay Wright award, University of Toronto, for exceptional contribution to the Dept. of Ecology and Evolutionary Biology
- 2014 – Grants-in-aid of Research, Sigma Xi: **\$700**
- 2014 – Best Talk Award, Ecological Section at Botany 2014, Botanical Society of America: **\$500**
- 2014 – Ecological Section Student Travel Award, Botanical Society of America: **\$500**
- 2014 – Frederick P. Ide Graduate Award in EEB, University of Toronto: **\$1917**
- 2014 – Robert L. Jefferies Graduate Award, University of Toronto: **\$797**
- 2013 – Nominated by students for outstanding teaching assistant award
- 2013 – Jeanne F. Goulding Fellowship, University of Toronto: **\$2000**
- 2012 – Graduate Student Research Award, Botanical Society of America: **\$500**
- 2011 – E. M. Walker Graduate Award in Biodiversity, University of Toronto: **\$2800**
- 2011 – Monroe Landon Memorial prize for conservation research, University of Guelph: **\$550**
- 2011 – Young Botanist Award, Botanical Society of America: BSA membership
- 2011 – Best poster award at Ontario research conference, Canadian Botanical Association: **\$100**
- 2010 – Best Thesis Proposal award, University of Guelph: **\$300**

INVITED SEMINARS

Upcoming: Michigan State University (Spring 2020), ESA symposium (Summer 2020)

The ecology and evolution of biodiversity in spatially-structured landscapes

- 2019 - Dept. Zoology, UBC
- 2019 - Dept. Botany, UBC
- 2019 - University of Calgary
- 2018 - Stanford University
- 2018 - University of Minnesota
- 2017 - Biodiversity Research Centre, UBC
- 2017 – McGill University

Pattern, process, and the maintenance of biodiversity across scales

- 2019 - Dept. Zoology, UBC
- 2019 - Dept. Botany, UBC
- 2018 - University of Victoria

Historical contingencies in the ecology and evolution of species diversity

- 2017 - Biodiversity Research Centre, UBC

2017 - Botany, UBC

2016 - Meeting of the Canadian Society for Ecology and Evolution, St. Johns, NL
Selected by a committee to speak in special section: Excellence in Doctoral Research

Cascading effects of spatial structure across trophic levels

2017 - Meeting of the Canadian Society for Ecology and Evolution, Victoria, BC

2016 – *BLISS*: Biodiversity Legendary Internal Seminar Series, UBC

Species coexistence: macroevolutionary relationships and the contingency of historical interactions, 2016, Early Career Scientist Symposium, Ann Arbor, Michigan

Selected by a committee to speak at this prestigious symposium; Media coverage: “[12th U-M EEB Early Career Scientists Symposium still hitting its stride](#)”, *U Michigan News*

CONFERENCE PRESENTATIONS

Germain RM (2020) The evolutionary ecology of species coexistence. Meeting of the American Society of Naturalists, Asilomar, CA

Germain RM (2019) The evolutionary ecology of species coexistence. 104th Meeting of the Ecological Society of America, Louisville, KY

Germain RM (2018) The evolutionary ecology of species coexistence. Joint Evolution/ESEB/ASN meeting in Montpellier, France – Young Investigator Award Symposium

Germain RM (2018) Characteristic scales of biodiversity and their ecological underpinnings. 150th meeting of the American Society of Naturalists, Asilomar, CA

Germain RM (2017) Moving character displacement beyond characters using contemporary coexistence theory. 102th Meeting of the Ecological Society of America, Portland, OR (poster)

Germain RM (2016) Historical contingencies in the ecology and evolution of species diversity. Ecology & Evolutionary Biology exit seminar at the University of Toronto

Germain RM, SY Strauss, B Gilbert (2015) Limits to plant diversity: an experimental decoupling of local and regional control. 100th Meeting of the Ecological Society of America, Baltimore, MD

Germain RM (2014) The evolution of coexistence mechanisms. Ecology & Evolutionary Biology departmental seminar at the University of Toronto

Germain RM, B Gilbert (2014) The evolution of species invasion potential. Terrestrial Invasive Plant Symposium, Mississauga, CA

Germain RM, B Gilbert (2014) Ghost of environments past: maternal effects reveal species niche dimensions. Botany 2014 New Frontiers, Boise, ID

Won two awards from the Botanical Society of America: travel grant and best ecological presentation

Germain RM, B Gilbert (2014) Ghost of environments past: maternal effects reveal species niche dimensions. Genomes to/aux Biomes: Joint meeting of CSEE, SCZ, SCL, Montreal, CA

Germain RM, B Gilbert (2013) Phylogeny-coexistence relationships: disentangling the role of species differences, environment, and biogeography. 98th Meeting of the Ecological Society of America, Minneapolis, MN

Germain RM, B Gilbert (2012) Evolution of coexistence mechanisms in Mediterranean annual plant communities. 97th Meeting of the Ecological Society of America, Portland, OR

Germain RM, B Gilbert (2012) Evolution of species interactions: finding meaning in community-level phylogenetic patterns. Evolution: 1st Joint Congress on Evolutionary Biology, Ottawa, ON

Germain RM, B Gilbert (2012) Evolution of species interactions: finding meaning in community-level phylogenetic patterns. Atwood Memorial Colloquium, University of Toronto, Toronto, ON

Germain RM, L Johnson, AS MacDougall, K Cottenie, E Gillis (2011) Spatial variability in granivory determines the strength of stochasticity during community assembly. 96th Meeting of the Ecological Society of America, Austin, TX

Germain RM, L Johnson, AS MacDougall, K Cottenie, E Gillis (2011) Spatial variability in granivory determines the strength of stochasticity during community assembly. Ontario Ecology, Ethology, & Evolution Colloquium, University of Toronto at Scarborough, Toronto, ON

Germain RM, L Johnson (2011) Little mouse on a prairie: small mammal impacts on native plant diversity. *rare* Charitable Research Reserve, Blair, ON

Germain RM, CM Caruso, H Maherali (2011) Functional traits underlie adaptive parental effects in the annual grass *Avena barbata*. Ontario Biology Day, Wilfred Laurier University, Waterloo, ON

Won best poster award from the Canadian Botanical Association

ACADEMIC SERVICE

A. Departmental (BRC = UBC Biodiversity Research Centre; EGSA = UofT Ecology & Evolution Graduate Student Association)

2019 – Search committee, ecology lab coordinator and instructor, BRC

2018 – Organizer, Squamish Eco-Evo retreat, BRC

- 2017 – Misc. committees: space committee, postdoc rep for Dept. Zoology external review, BRC
- 2017 – Organizer, Squamish Eco-Evo retreat, BRC
- 2017 – Search committee, President’s Excellence Chair faculty search, BRC
- 2017 – Search committee, Biodiversity Postdoctoral Fellowship, BRC
- 2016 – Coordinator, Biodiversity Discussion Group, BRC
- 2016 – Coordinator, Biodiversity Legendary Internal Seminar Series (BLISS), BRC
- 2016 – Organizing committee, Squamish Eco-Evo retreat, BRC
- 2016 – Panel speaker, EEB seminar at UofT, “Failing your way to success: a balanced perspective of life in academia”; presented a “real CV” of successes and failures to remind graduate students that perceived failures are normal and part of learning
- 2016 – President, EGSA; responsible for running the EGSA and representing graduate student interests at faculty meetings
- 2015 – Atwood Colloquium Chair, EGSA; head of committee tasked with selecting, inviting, and hosting an esteemed professor of ecology and evolutionary biology (Dr. Sally Otto) at a prestigious annual event
- 2014 – Atwood Colloquium selection committee, EGSA; participated in the selection of the 2013 Atwood lecturer (Dr. Dolph Schluter)
- 2013 – Social coordinator (two terms), EGSA; responsible for organizing and advertising all departmental social events (HallowEEB, Darwin Day, etc.)

B. Non-departmental

- 2017 – Invited speaker, “How to run a graduate mental health workshop in your department” Meeting of the Canadian Society for Ecology and Evolution, St. Johns, NL
- 2016 – Organizer, working group: “A trophic framework for metacommunity ecology”
- 2016 – Organizer, accepted symposium at upcoming meeting of the Canadian Society for Ecology and Evolution, “Metacommunity theory for real-world communities: theoretical and empirical advances for trophic metacommunities”
- 2016 – Organizer, symposium at the meeting of the Canadian Society for Ecology and Evolution, “[The interplay between ecology and evolution in spatially-structured landscapes](#)”
- 2015 – Workshop development, School of Graduate Studies. Working with the Dean’s office to develop mental health initiatives for graduate students across the University of Toronto
Media coverage: “[Graduate students identify strategies to boost morale, mental health](#)”, *U of T News*
- 2015 – Invited panel speaker, University of Toronto’s President’s office on ways to improve graduate student experiences in the Faculty of Arts and Sciences

2014 – Publications Committee member, *Botanical Society of America*; two-year term, tasked with modernizing the American Journal of Botany for a new generation of scientists

C. Reviewer services (47 total)

Acta Biotheoretica, American Naturalist (x4), Axios Review, Botany, Ecography, Ecology (x2), Ecology Letters (x9), Evolution, Evolutionary Ecology (x2), Functional Ecology (x4), Global Change Biology, Journal of Animal Ecology (x2), Journal of Ecology (x4), Journal of Vegetation Science, Movement Ecology, National Science Foundation, Nature Ecology & Evolution (x3), Oecologia, Oikos, Plos ONE, Proceedings of the National Academy of Sciences USA (x3), Proceedings of the Royal Society B (x2)

D. Students

Advisor:

Mia Waters (PhD student, 09/2019-current)

Megan Szojka (MSc, 09/2018-current)

Jawad Sakarchi (MSc, 05/2019-current)

Chelsea Little (Postdoctoral Fellow, 09/2019-current)

Danielle Main (directed studies, 01/2019-05/2019)

Kately Nikiforuk (UBC SURE research + directed studies, 05/2019-12/2019)

Jenny Mackay (UBC SURE research, 05/2019-12/2019)

Kelley Slimon (directed studies, 09/2018-05/2019)

Thesis advisory committee member: Natasha Busch (MSc committee, Dept. Botany, 2018), Deirdre Loughan (PhD committee, Dept. Forest and Conservation Sciences, 2019)

Technicians: Genevieve Ke (current), Dennis Chiu (2018)

Examination committee member: Takuji Usai (PhD qualifying exam, Dept. Botany, 2019)

TEACHING EXPERIENCE

A. University courses

2019 – Lecturer, BIOL230 *Fundamentals of Ecology*

2019 – Guest lecturer, *Ecological Methods*; lecture on generalized linear models.
Professor: Diane Srivastava

2018 – Guest lecturer, *Insect Ecology*; lecture on competition theory. Professor: Michelle Tseng

2016 – Lab tutorials, four terms, *Community Ecology*

2015 – Course development, *Community Ecology*. Designed computer simulations of species coexistence for laboratory exercises

- 2015 – Guest lecturer, *Community Ecology*; lecture on species coexistence and phylogenetic community assembly. Professors: Megan Frederickson/Benjamin Gilbert
- 2014 – Guest lecturer, *Community Ecology*; lecture on community phylogenetics. Professors: Martin Krkosek/Karen Alofs
- 2013 – Lab tutorials, one term, *Population Ecology*
Nominated by students for Outstanding Teaching Assistant Award
- 2012 – Lab tutorials, one term, *From Genomes to Ecosystems in a Changing World*
- 2011 – Lab tutorials, two terms, *Adaptation and Biodiversity*

B. Student mentoring

I have assisted in the guidance of the following undergraduate students, as they conducted independent research projects (†) and gained experience with research techniques in the lab and greenhouse (‡):

Genevieve Ke‡, Dennis Chiu‡, Anthony Miyagi‡, Annette Misiurak‡, Danielle Main‡, Kephra Beckett‡, Leanne Kim†, Joanne Plahouras†, Alexander Fang†, Munzir Rahman†, Christopher Blackford†, James Boyko†, Alexandra Mushka†, Alanna Leale†, Deirdre Loughan‡, Mags Ngo‡, Alicia Chou‡, Kevin Hawkshaw‡, Yvonne Chan‡, Rasheeq Hossein‡, Abdul Yossof‡, June Nguyen‡, Veronica Chong‡, Aftab Erfanny‡, Haley Branch‡, Michelle Lee‡

C. Science outreach

Let's Talk Science National – Presented *Dispersal Detectives: The Diversity and Adaptations of Seeds*, an interactive science exhibit on functional trait variation among seed species, to engage middle school students in scientific observation and discovery

Planting Science, Botanical Society of America – Scientist mentor, five terms, mentored middle school and high school students as they conducted experiments on pollination and seed germination