

Sophie T. Breitbart

Research Software Engineer

✉️ sophie.breitbart@gmail.com ↗ [sbreitbart](https://sbreitbart.com) ↗ sbreitbart.github.io

Education

University of Toronto , Toronto, ON, Canada	2018-2024
Ph.D., Ecology & Evolutionary Biology	
Advisors: Drs. Marc Johnson and Helene Wagner	
Wesleyan University , Middletown, CT, USA	2012-2016
B.A., Biology, Certificate in Integrative Genomics Sciences: Informatics & Modeling	
Queen Mary, University of London , London, UK	1-5/2015
Study Abroad Program	

Research & Professional Experience

Stock Assessment Data and Software Workflow Modeler , ECS	2024-present
Remote	
Support NOAA Fisheries by developing R packages to streamline workflows, improve reproducibility, and enhance transparency of operational fisheries stock assessments.	
Graduate Research Assistant , University of Toronto Mississauga	2018-2024
Mississauga, ON, Canada	
PIs: Drs. Marc Johnson and Helene Wagner	
Thesis title: Effects of Urbanization on the Evolutionary Ecology & Population Genetics of Common Milkweed (<i>Asclepias syriaca</i>)	
Staff Scientist I , Princeton Hydro	2016-2018
South Glastonbury, CT, USA	
Devising dam removal plan sets with AutoCAD, spatial analysis and map creation with ArcGIS, watershed management plan writing.	
Aquatics Intern , Princeton Hydro	2016
South Glastonbury, CT, USA	
Water quality testing, aquatic plant mapping, spatial analysis with ArcGIS.	
Undergraduate Researcher , Wesleyan University	2014-2016
Middletown, CT, USA	
PIs: Drs. Barry Chernoff and Helen Poulos	
Dace (<i>Rhinichthys atratulus</i> , <i>Rhinichthys cataractae</i>) biogeography and phylogeography.	
Undergraduate Researcher , Wesleyan University	2013-2014
Middletown, CT, USA	
PI: Dr. Fred Cohan	
<i>Bacillus</i> phylogeography and speciation.	
Independent Study , Skidmore College	2009-2011
Saratoga Springs, NY, USA	
PI: Dr. Bernard Possidente	
Circadian locomotor activity in <i>Drosophila melanogaster</i> .	

Honors & Awards

RESEARCH GRANTS

University of Toronto EEB PhD Research Grant (\$2,000)	2021
Centre for Urban Environments Research Grant (\$1,940)	2021
Sigma Xi Grant in Aid of Research (\$1,000)	2020
Centre for Urban Environments Workshop/Symposium Grant (\$2,500) <i>Co-applicants: L. Miles, H. Abdel Hafez.</i>	2020
NSERC CREATE Enviro Trainee (\$23,700) <i>Primary applicants: H. Wagner, M. Johnson.</i>	2018-2019
Wesleyan University College of the Environment Summer Research Fellowship (\$4,000)	2014
Wesleyan University Carol and Robert Lynch Student Research Fund Grant (\$905)	2013
Wesleyan University Howard Hughes Medical Institute Grant (\$884)	2013

SCHOLARSHIPS & AWARDS

Society for the Study of Evolution Conference Travel Award (\$500)	2023
Zimmerman/Weis Graduate Award (\$10,950/year)	2020, 2021
International Association for Landscape Ecology Conference Travel Award (\$600)	2019
Joseph Scacalossi Scholarship (\$4,000)	2012

Publications

JOURNAL ARTICLES

5. **Breitbart, S.T.**, M.T.J. Johnson, H.H. Wagner. 2025. Anthropogenic Landscape Alteration, but Not Urbanization, Influences Non-Adaptive Evolution in Common Milkweed (*Asclepias syriaca* L.). *Ecology and Evolution* 15:e71250. <https://doi.org/10.1002/ece3.71250>
4. **Breitbart, S.T.**, A.A. Agrawal, H.H. Wagner, M.T.J. Johnson. 2023. Urbanization and a green corridor do not impact genetic divergence in common milkweed (*Asclepias syriaca* L.). *Scientific Reports* 13:20437. <https://doi.org/10.1038/s41598-023-47524-8>
3. **Breitbart, S.T.**, A. Tomchyshyn, H.H. Wagner, M.T.J. Johnson. 2023. Urbanization and a green corridor influence reproductive success and pollinators of common milkweed. *Urban Ecosystems* 26:31–43. <https://doi.org/10.1007/s11252-022-01278-9>
2. Miles, L.S.*, **S.T. Breitbart***, H.H. Wagner, and M.T.J. Johnson. 2019. Urbanization shapes the ecology and evolution of plant-arthropod herbivore interactions. *Frontiers in Ecology and Evolution* 7:1–14. <https://doi.org/10.3389/fevo.2019.00310>
1. **Breitbart, S.** and Weigel, E. February 2019, posting date. **Visualizing a disease outbreak using ESRI story maps.** *Teaching Issues and Experiments in Ecology*, Vol. 15: Practice #1 [online].

BOOK CHAPTERS

1. Santangelo J.S., Miles, L.S., **Breitbart, S.T.**, Murray-Stoker, D., Rivkin, L.R., Johnson, M.T.J. and Ness, R.W., *Urban environments as a framework to study parallel evolution*. In: *Urban Evolutionary Biology*. Edited by Marta Szulkin, Jason Munshi-South and Anne Charmantier: Oxford University Press (2020). © Oxford University Press. <https://doi.org/10.1093/oso/9780198836841.003.0003>

OTHER PUBLICATIONS

2. **Breitbart, S.** [Urban Evolution: A Brief Introduction](#). ESRI StoryMap. May 2020.
1. **Breitbart, S.**, Hildebrandt, A., Possidente, B. 2010. [Assessing effects of sex, mating status, and a white-eye mutation in a co-isogenic background on circadian locomotor activity in *Drosophila melanogaster*](#). Drosophila Information Service 93:171-175.

Invited Presentations

8. **Breitbart, S.**. *Asclepias* in the Annex: How city life impacts the ecology and evolution of common milkweed. Public Seminar. Toronto Field Naturalists Lecture Series, Toronto, Canada. 9/10/2023.
7. **Breitbart, S.**. A two-way street: Eco-evolutionary dynamics of common milkweed in urban environments. Public Seminar. New York Botanical Garden Ecoflora Project Seminar Series, The Bronx, New York. 11/29/2022.
6. **Breitbart, S.**, Anurag, A., Wagner, H., Johnson, M. A two-way street: Eco-evolutionary dynamics of common milkweed in urban environments. Guest Seminar. Kennesaw State University EEOB Seminar Series, Kennesaw, Georgia. 10/6/2022.
5. **Breitbart, S.**, Anurag, A., Wagner, H., Johnson, M. Uncovering the Roots of Phenotypic Divergence in Urban Milkweed. Flash Talk. Integrating Society, Ecology, Evolution, and Plasticity (SEEP) to Advance Urban Evolutionary Ecology. Workshop, Tempe, Arizona. 5/20/2022.
4. **Breitbart, S.**, Wagner, H., Johnson, M. Urbanization Affects the Ecology and Evolution of *Asclepias syriaca* (Common Milkweed). Guest Seminar. National Center for Ecological Analysis & Synthesis (NCEAS). 1/19/2022.
3. **Breitbart, S.** Urban Evolutionary Ecology & Career Path Advice. Invited Seminar Panel. Biodiversity and the City (EEB197), Toronto, Ontario. 1/28/2020.
2. **Breitbart, S.** Urban Evolution of Common Milkweed. Guest Lecture. Temperate Field Biology (EEB 405), King City, Ontario. 5/25/2019.
1. **Breitbart, S.** Ecological Niche Modeling with Maxent. Guest Lecture. Evolutionary and Ecological Bioinformatics (BIOL 327), Middletown, Connecticut. 11/19/2015.

Presentations

16. **Breitbart, S.**. [Increasing the Accessibility of Quarto-Based NOAA Fisheries Reports](#). Presentation. USRSE, Philadelphia, USA. 10/7/2025.
15. Johnson, M., **Breitbart, S.**, et al. Bacteria, bugs, and bees oh my! The role of cities in shaping species interactions and communities. Presentation. Canadian Society for Ecology & Evolution (CSEE), Sherbrooke, Canada. 7/7/2025.
14. **Breitbart, S.**, Johnson, M., Wagner, H. How does the urban landscape affect genetic diversity and genetic differentiation in a native plant of conservation importance? Presentation. Evolution, Albuquerque, USA. 6/23/2023.
13. **Breitbart, S.**, Agrawal, A.A., Wagner, H., Johnson, M. Does Urbanization Promote Genetic Divergence of Functional Traits in *Asclepias syriaca* (Common Milkweed)? Presentation. Joint

Annual Meeting of the Ecological Society of America (ESA) and Canadian Society for Ecology & Evolution (CSEE), Montreal, Canada. 8/16/2022.

12. **Breitbart, S.**, Agrawal, A., Wagner, H., Johnson, M. Urbanization Promotes Genetic Divergence of Functional Traits in *Asclepias syriaca* (Common Milkweed). Presentation. Evolution, Cleveland, USA. 6/25/2022.
11. **Breitbart, S.**, Wagner, H., Johnson, M. Testing for Genetic Clines in Phenotypic Traits Along an Urban-Rural Gradient in *Asclepias syriaca*. Presentation. Canadian Society for Ecology & Evolution (CSEE), Virtual Conference. 8/18/2021.
10. **Breitbart, S.**, Wagner, H., Johnson, M. Testing for Genetic Clines in Phenotypic Traits Along an Urban-Rural Gradient in *Asclepias syriaca*. Presentation. Evolution, Virtual Conference. 6/21/2021.
9. **Breitbart, S.** Applying to and Succeeding in Graduate School. Seminar Panel. Honors Biology Thesis Course (BIO481), Virtual Seminar. 11/27/2020.
8. **Breitbart, S.**, Wagner, H., Johnson, M. Effects of Urbanization on Reproductive Success in Common Milkweed. Presentation. University of Toronto Mississauga Graduate Research Colloquium, Virtual Conference. 5/27/2020.
7. **Breitbart, S.**, Wagner, H., Johnson, M. Effects of Urbanization on Reproductive Success in Common Milkweed. Presentation. Annual Meeting of the North American Regional Association of the International Association for Landscape Ecology, Virtual Conference. 5/11/2020.
6. **Breitbart, S.**, Wagner, H., Johnson, M. Effects of Urbanization on Reproductive Success in Common Milkweed. Seminar Presentation. Swiss Federal Institute for Forest, Snow and Landscape Research, Birmensdorf, Switzerland. 7/10/2019.
5. **Breitbart, S.**, Wagner, H., Johnson, M. Effects of Urbanization on Reproductive Success in Common Milkweed. Flash Talk. International Association for Landscape Ecology World Congress, Milan, Italy. 7/2/2019.
4. **Breitbart, S.** Elevator Pitch. Atwood Colloquium, Toronto, Ontario. 4/13/2019.
3. **Breitbart, S.**, Poulos, H., Kraczkowski, M., Chernoff, B. (2016). Using GIS to Predict Effects of Landscape Metrics on Genetic Diversity in *R. atratulus*. Poster Presentation. Northeast Arc Users Group Spring Spatial Technologies Conference, Amherst, Massachusetts. 5/9/2016.
2. Chernoff, B., Kraczkowski, M., Angel, J., Meyer, A., Nash, C., Roman-Johnston, N., **Breitbart, S.**. Over the Falls: Population Differentiation of Blacknose and Longnose Dace, *Rhinichthys atratulus* and *R. cataractae*, in Connecticut. Poster Presentation. Wesleyan Summer Research Symposium, Middletown, Connecticut. 7/31/2014.
1. **Breitbart, S.**, Hildebrandt, A., Possidente, B. (2010). Assessing Effects of Sex, Mating Status, and a White-Eye Mutation in a Co-Isogenic Background on Circadian Locomotor Activity in *Drosophila melanogaster*. University at Albany Undergraduate Research Symposium, Albany, New York. 4/29/2011.

Workshops

6. **Breitbart, S.**, Filazzola, A. (2022). An Ecologist's Introduction to Data Science. Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology (SORTEE) Webinar Series. https://sbreitbart.github.io/DataSci_for_Ecologists/

5. **Breitbart, S.**, Filazzola, A. (2022). An Ecologist's Introduction to Data Science. Joint Annual Meeting of the Ecological Society of America (ESA) and Canadian Society for Ecology & Evolution (CSEE). https://sbreitbart.github.io/DataSci_for_Ecologists/
4. **Breitbart, S.**, Filazzola, A. (2021). BGSS Fall Retreat 2021 Coding Workshop. University of Toronto Mississauga Biology Graduate Student Society Fall Retreat. https://sbreitbart.github.io/BGSS_Retreat_2021_Workshop/
3. Filazzola, A., **Breitbart, S.** (2021). Fast-R: Improving the Reproducibility and Efficiency of your Coding. Santa Barbara R Meetup. <https://afilazzola.github.io/SBMeetup2021-FastR/>
2. Filazzola, A., **Breitbart, S.** (2021). Fast-R: Making R Work Hard So That You Don't Have To. Canadian Society for Ecology & Evolution (CSEE) Annual Meeting. <https://afilazzola.github.io/FastR/>
1. Filazzola, A., **Breitbart, S.** (2021). Fast-R: Making R Work Hard So That You Don't Have To. Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology (SORTEE) Annual Meeting. <https://afilazzola.github.io/FastR/>

Teaching & Supervisory Experience

TEACHING

University of Toronto Mississauga

Teaching Assistant , Evolutionary Biology (BIO342)	2021, 2022, 2023, 2024
Teaching Assistant , Biometrics (BIO360)	2019, 2020, 2021
Teaching Assistant , Introduction to Evolution & Evolutionary Genetics (BIO152)	2019
Teaching Assistant , Ecology (BIO205)	2018

Princeton Hydro

Intern Manager , New England Regional Office	2017
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Wesleyan University

Professorial Assistant, Peer Tutor, Cartographer , GIS Assistant Program	2015-2016
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Community Involvement

REVIEWER FOR

Ecology & Evolution, Functional Ecology, Proceedings of the Royal Society B: Biological Sciences, Journal of Urban Ecology

DEPARTMENTAL SERVICE

UTM Representative (elected), EEB Graduate Student Association	2021-2023
Fundraising Representative (elected), EEB Graduate Student Association	2020-2021
Treasurer , UTM Biology Graduate Student Society	2020-2021
Undergraduate Mentor , Grad Connect Mentorship Program	2020-2021
Volunteer , School of Graduate Studies Listening Sessions for Women in STEM	2020
Organizer & Guide , Greenhouse Tour (Wellness Event for UTM Grads)	2019
Peer Mentor , EEB Mentorship Program	2019-2024
Volunteer , "Biodiversity in the City" Public Panel Discussion, Royal Ontario Museum	2019
Volunteer , Alumni and Friends Family Day at the Koffler Scientific Reserve	2019
Member , UTM Biology Graduate Student Society	2018-2024

ACADEMIC SERVICE

Data Scientist , NSERC Alliance Knowledge Translation Project: "Implementing Landscape Connectivity Assessment for Biodiversity Management and Land-use Planning in Alberta"	2023-2024
Workshop Co-organizer , "Getting to Know Open Science: How to Engage and Flourish in the Growing Open Science Community". 2023 Ecological Society of America (ESA) Conference	2023
Data Scientist , University of Toronto & University Health Network Project: "#Team Vaccine: Exploring the History of Toronto's COVID-19 Vaccination Initiative through Social Media"	2023
Executive Committee Member , University of Toronto Coders	2022-2024
Symposium Co-organizer , "Landscape Genetics as a Tool for Managing Human-Impacted Landscapes". 2020 IALE-North America Conference	2019-2020
Mentor , MentorNet	2019
Steering Committee Member , Wesleyan Women in Science	2013-2016
Panelist , Wesleyan Women in Science Summer STEM Internship Info Session	2016
Science Facilities Tour Guide , WesFest (Wesleyan's Admitted Students Recruitment Event)	2014
Member , Wesleyan Women in Science	2012-2013

ORGANIZATIONS & MEMBERSHIPS

Member , United States Research Software Engineers (US-RSE)	2025-present
Certified Instructor , The Carpentries	2021-present
Member , Society for the Study of Evolution (SSE)	2021-2024
Member , Sigma Xi: The Scientific Research Honor Society	2021-2024
Chapter Coordinator , Canadian Association for Girls in Science- Toronto Chapter	2020-2022
Volunteer , Canadian Association for Girls in Science- Toronto Chapter	2019-2020
Founder & Leader , Walking in the Woods with Words (Forest Bathing Club)	2019-2020
Member , Canadian Society of Ecology and Evolution (CSEE)	2018-2024
Volunteer , High Park Nature Stewards	2018-2020

SCIENCE COMMUNICATION

Volunteer , Skype a Scientist (3 classes)	2020-2021
Interviewee , "Scientific Names", <i>Toronto Nature Now</i> Radio Show	2020
Writer , Life in the City Urban Evolution Blog , www.urbanevolution-litc.com	2018-2024