

Curriculum Vitae

Emma Lehmborg, MSc

Department of Ecology & Evolutionary Biology
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Research Interests

My research focuses on speciation and adaptation, with special interest in how novel traits may or may not facilitate speciation in particular clades of the tree of life. To pursue these questions, I use comparative phylogenetic methods to examine interactions between particular traits and their relationship to hybridization. My dissertation work is building a phylogeny using full genomes to examine whether the rapid evolution of placentation has limited historical hybridization and accelerated reproductive isolation in live-bearing guppies, mollies, and swordtails (Poeciliinae).

Education

Sept 2018 – present **Ph.D. student, Ecology & Evolutionary Biology**
Thesis topic: Hybridization and placentation in live-bearing fishes (Poeciliinae)
Advisor: Gil G. Rosenthal
Texas A&M University

Sept 2013 – May 2015 **MSc., Ecology & Evolutionary Biology**
Thesis topic: Biogeography of the Weakly Electric Knifefish *Gymnotus carapo* (Teleostei: Gymnotiformes) in the Guianas of South America
Advisor: Nathan R. Lovejoy
University of Toronto

Sept 2007 – May 2012 **BA, Honours in English with Major in Biology**
University of Ottawa, Canada

Teaching Experience

Sept 2018 – May 2019 **Teaching Assistant, Texas A&M University, College Station, TX, USA**
Introduction to Biology (BIO111, BIO107, BIO112H)

- Instructed students during labs
- Communication of lab course materials, grading, pre-lab presentations

- Nov 2015 – July 2018** **Biology Lab Technician, Lakehead University, Thunder Bay, Canada**
 Aboriginal Ethnobotany (BIOL3012), Biology of Fishes (BIOL4212), Animal Biology (BIOL1110), Ornithology (BIOL4231), Aquatic Ecology and Experimental Limnology (BIOL4152)
- Design, supervision, and implementation of experimental labs for undergraduate courses in conjunction with professors
 - TA supervision for the above courses, including weekly meetings and semester-end reviews
 - Lab specimen inventory and ordering for courses
- Sept 2013 - May 2015** **Teaching Assistant, University of Toronto Scarborough, Toronto, Canada**
 Life on Earth: Unifying Principles (BIOA01), Life on Earth II: Form, Function and Integration (BIOA02), Introduction to Ecology and Evolutionary Biology (BIOB52), Evolutionary Genetics (BIOC16), Special Topics in Biodiversity and Systematics (BIOD52)
- Instructed students during labs
 - Communication of lab course materials, grading, pre-lab presentations

Academic Work Experience

- Nov 2015 – July 2018** **Curator, Claude E. Garton Herbarium, Lakehead University, Thunder Bay, Canada**
- Management of vascular plant and non-vascular collections (~125 000 vouchers)
 - Initiated a digitization effort on the collections
 - Organization of vouchers as reference for botanical courses
 - Outreach in the local community on behalf of the herbarium and Biology department
- April 2015 – Aug 2015** **Environmental Consultant, Basket Lake Camp, Dryden, Canada**
- Literature review of moose (*Alces alces*) research in Northwestern Ontario
 - Survey of bays on Basket Lake, Ontario to record moose-suitable habit
 - Delivery of a report on findings
- Aug 2012 – 2014** **Collections and Education Contractor, Canadian Museum of Nature (CMN), Ottawa, Canada**
- Use of protocols to collect freshwater invertebrates for educational purposes
 - Identification of collections to Order
- May – Aug 2011-2013** **Environmental Monitoring Technician, CMN, Ottawa, Canada**
- Botanical and entomological surveys
 - Water monitoring and chemistry

- Collections of fishes, plants, and insects for museum collections
- Collection of local mosses for DNA barcoding

Scholarships and Awards

Texas A&M University, Applied Biodiversity Science Diversity Scholarship...(2018)
 University of Toronto, Frederick P. Ide Scholarship.....(2014)
 University of Toronto, Edna Margaret Roberston Scholarship.....(2014)
 University of Toronto, Arts and Sciences Fellowship.....(2013)
 University of Toronto, E.M. Robertson Scholarship.....(2013)
 University of Ottawa, Merit Scholarship.....(2007)

Peer-Reviewed Publications

Lehmberg, E.S., McKee, G., and Rennie, M.D. Hiding in plain sight: Using amateur naturalist records and herbarium vouchers to examine changing phenology in the early blooming angiosperms of Northwestern Ontario, Canada. In prep.

Lehmberg, E.S., Elbassiouny, A.A., Bloom, D.D., López-Fernández, H., Crampton, W.G.R., and Lovejoy, N.R. Fish biogeography in the “Lost World” of the Guiana Shield: Phylogeography of the weakly electric knifefish *Gymnotus carapo* (Teleostei: Gymnotidae). *Journal of Biogeography*. 2018. DOI: <https://doi.org/10.1111/jbi.13177>

Elbassiouny, A.E., Schott, R., Waddell, J.C., Kolmann, M.A., **Lehmberg, E.S.**, Van Nynatten, A.D., Crampton, W.G.R., Chang, B., and Lovejoy, N.R. Mitochondrial genomes of the South American electric knifefishes (Order Gymnotiformes). *Mitochondrial DNA Part B*. Vol. 1. 2016. DOI: <http://dx.doi.org/10.1080/23802359.2016.1174090>

Non-Peer Reviewed Publications

Lehmberg, E.S. “The Woods were Lovely Dark and Deep.” *Canadian Museum of Nature*. September 24, 2012. Blog.

Lehmberg, E.S. and Robillard, C. “Research and collections: How about Stewardship?” *Canadian Museum of Nature*. May 25, 2012. Blog.

Lehmberg, E.S. “Wild at the Core, Human at the Edge.” *Canadian Geographic*. June 2010. 36. Print.

Lehmberg, E.S. “An Earth-Shaking Industry?” *Canadian Geographic*. April 2010. 24. Print.

Lehmberg, E.S. “All the World’s a Laboratory.” *Canadian Geographic*. January/February 2010. 26. Print.

Fick, S. and **Lehmberg, E.S.** “A Crowded Neighbourhood.” *Canadian Geographic*. December 2009. 31. Print

Academic Presentations

Lehmberg, E.S., Travis, J., Reznick, D., and Rosenthal, G. Battle of the Sexes: How viviparity-driven conflict may preclude hybridization in the live-bearing Poeciliinae. 8th Conference of Poeciliid Biologists, Mexico City, Mexico. September 2019.

Lehmberg, E.S. Hybridization and Placentation in the live-bearing Poeciliinae. EEB Research Blitz. EEB Interdisciplinary Program, Texas A&M University, Texas, USA. February 2019.

- Lehmberg, E.S.** Herbarium Research Practices. Annual Biology Research Symposium. Department of Biology, Lakehead University, Thunder Bay. February 2018.
- Lehmberg, E.S.** The Claude Garton Herbarium. Department of Biology, Lakehead University, Thunder Bay. January 2018.
- Lehmberg, E.S.** & Malek, L. The Claude Garton Herbarium: Past, Present, & Future. Thunder Bay Field Naturalists seminar, Thunder Bay Field Naturalists, Thunder Bay. September 2017.
- Lehmberg, E.S.** Natural History of the Thunder Bay Region. Lakehead University guest lecture for Place-Based Education, April 2016.
- Lehmberg, E.S.** Biogeography of the Banded Knifefish on the Guiana Shield. University of Toronto EEB Seminar, March 2015
- Lehmberg, E.S.** Biogeography of the Banded Knifefish on the Guiana Shield. Third Annual Interdisciplinary Research and Discovery Symposium, University of Toronto Scarborough, July 2014
- Lehmberg, E.S.** and Lovejoy, N.R. Biogeography of the Banded Knifefish on the Guiana Shield (poster presentation). Annual Joint Meeting of Ichthyologists and Herpetologists, Chattanooga, TN. 2014
- Lehmberg, E.S.** Environmental Monitoring Programme Year-End Presentation. Canadian Museum of Nature Seminar. 2011-2013
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Public Presentations

- Wildlife Ecology. Guest lecture with Natalie Hamilton, Bryan Collegiate High School, Bryan, Texas. February 2020.
- Sexual Selection and Animal Behaviour. EEB Darwin Day, EEB Interdisciplinary Program, Texas A&M University, Texas, USA. February 2019, 2020.
- Educational hike. Centro de Investigaciones Científicas de las Huastecas "Aguazarca" Uniendo Ciencia y Servicio (CICHAZ), Calnali, Hidalgo, Mexico. June 2018.
- Boreal Phenology: public walking tours of Lakehead Region Conservation Authority (Mills Block). Claude Garton Herbarium & Lakehead University, Thunder Bay, Ontario, Canada. March – June, 2018.
- The Herbarium: Where Plants Go to Die & Then Live Forever. Native Access Program, Lakehead University, Thunder Bay. September 2016, 2017.
- Animal Communication: Weakly Electric Knifefish. Native Child and Family Services of Toronto, University of Toronto Scarborough. July 2015.
- Animal Communication: Weakly Electric Knifefish. Bring Your Kids to Work (Outreach Day), University of Toronto Scarborough. April 2015.
- Work in the Woods: Educational tours of CMN trails. Environmental Monitoring Program, Canadian Museum of Nature. Summers 2011, 2012, 2013.
- Identification and collection of freshwater invertebrates. Environmental Monitoring Program, Canadian Museum of Nature. September 2012
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Mentorship

I believe that mentorship is the act of taking on enthusiastic undergraduate students, actively listening to their academic and career goals, and designing projects that help both of us achieve our research aims. I strive to have an open dialogue with students, seeking their input when appropriate. It is especially important to me to create a scientific space in which all people, regardless of gender, race, class, or ability are welcome and are able explore questions interesting to them.

Claude Garton Herbarium

Yuen Ting Lam, student worker (2016-2018). Identification of plants, updating voucher database, researching historical phenology using local records.

Jordan Lukacs, student worker (2017-2018). Prototyping and testing of digitization set up.

Hanna Dorval, honors student (2016-2017). Use of vouchers and historical records for honors thesis on local rarity and specialization of orchids.

Rosenthal Lab

Paola Canales-Lozano, student worker (2018-present). Reorganization of lab wet fishes collection, database management, prep of specimens for shipping, website management.

Maria Prado, freshman honors student (2019-2020). Tagging, cataloguing, and prepping fishes in the collections.

Sara Johnson, junior honors student (2019-2020). DNA extractions, clean lab protocols.

Professional Memberships

Canadian Society for Ecology & Evolution

American Society of Naturalists

Society of Systematic Biologists

Thunder Bay Field Naturalists

Academic Service

Member of the American Society of Naturalists Graduate Student Council, three-year appointment (2019-2021)

- Graduate Student Awards Committee, 2020
- GSC Workshop Committee, 2020

General Officer, Ecology & Evolutionary Biology Interdisciplinary Student Organization, 2019-present

- EEB Journal Club Co-organizer, 2020 - present

Judge, Texas State Science and Engineering Fair, 2019, 2020

Turtle survey volunteer, Canadian Organization for Tropical Education and Research, October 2012

Volunteer, Malacology, Canadian Museum of Nature, 2010-2012

Community Service

DJ/programmer, CILU 102.7fm, 2006/2007, 2008, 2010, 2015-2018
VP Alumni Affairs, University of Ottawa rowing executive, 2011/2012
Co-president, University of Ottawa rowing executive, 2010/2011
Editorial intern, Canadian Geographic, 2009/2010

Reviewer

Copeia, 2018

Professional Skills

Coding Languages

Unix, python, R

Fieldwork

Ichthyological collection and preservation, tissue sampling and preservation for sequencing, elastomer tagging for mark-recapture studies, field identifications of fishes, plants, and insects, DSLR camera use for morphometric photos, orienteering

Spoken Languages

English, intermediate French, beginner Spanish

Lab

Tissue preservation, sample preparation, PCR, primer design, DNA extraction

Certifications

Wilderness First Aid, 2014

First Aid & CPR, 2016
