

Sebastien PORTALIER

PERSONAL DATA

ADDRESS: University of Ottawa, STEM complex
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CURRENT POSITION

2019 Postdoctoral fellow, **University of Ottawa**, Ottawa, ON, Canada
- present "Modelling the effects of spruce budworm phenology on
its population dynamics in a changing climate"
Supervisor: Prof. Frithjof LUTSCHER, University of Ottawa

EDUCATION

2018 Ph.D in THEORETICAL ECOLOGY, **McGill University**, Montreal, QC, Canada
Thesis: "Effects of physical factors on the structure of communities"
Supervisor: Prof. Gregor FUSSMANN, McGill University
Co-supervisor: Prof. Michel LOREAU, CNRS Moulis, France
Co-supervisor: Prof. Mehdi CHERIF, Umeå University, Sweden
2009 Master of Science in ECOLOGY, **Paul Sabatier University**, Toulouse, France
Specialization in Modeling and Statistics
Thesis: "Importance of the stoichiometric niche in competition between
herbivore species"
Supervisor: Tanguy DAUFRESNE, INRA, Toulouse, France
GPA: 7.5 / 8
1999 Master of Science in BIOLOGY AND EDUCATION, **Paul Sabatier University**,
Toulouse, France
1998 B.S. in GENERAL BIOLOGY, **Paul Sabatier University**, Toulouse, France

CERTIFICATION

2023 Specialization in MACHINE LEARNING, **Stanford University**, via Coursera

RESEARCH EXPERIENCE

Postdoctoral project Modelling the effects of spruce budworm phenology
on its population dynamics in a changing climate

PhD Thesis Effects of physical factors on the structure of communities

Master Thesis Importance of the stoichiometric niche in competition between herbivore species

Side project Effects of mixed-species group formation on parasite load

TEACHING EXPERIENCE

- 2021 Guest lecturer, **Carleton University**, Ottawa, ON, Canada
Course: Evolution of Sex
- 2020 Guest lecturer, **Carleton University**, Ottawa, ON, Canada
Course: Evolution of Sex
- 2017 Guest lecturer, **McGill University**, Montreal, QC, Canada
Course: Population and Community Ecology
- 2010–2017 Teaching Assistant, **McGill University**, Montreal, QC, Canada
Courses: Methods in Biology of Organisms
Organismal Biology
Cell and Molecular Biology
- 2013–2018 R workshop designer, Quebec Centre for Biodiversity Science, Canada
- 2001–2007 Teacher in Biology (full time), High Schools, France

VISITING RESEARCHER

- 2016 IceLAB, Umeå University, Sweden
- 2014 IceLAB, Umeå University, Sweden
- 2013 IceLAB, Umeå University, Sweden
- 2012 Center of Ecology, Theory and Modelling, CNRS, Moulis, France

FIELD RESEARCH

- 2008 Center of Ecology, Theory and Modelling, CNRS, Moulis, France

TECHNICAL SKILLS

- Modeling** Differential equations, difference equations, circle maps, analytical and numerical exploration, parameter optimization
- Programming** R, Matlab, C++, Java, Python, parallel programming
- Statistics** Regressions, multivariate analysis, data mining, network analysis,
- Machine learning** Neural networks, tree methods, unsupervised learning
- Big data** Database management (PostgreSQL)
- GIS** ArcGIS, GRASS
- Specific skills** Git, website creation

PUBLICATIONS

Peer reviewed articles

- 2022 **Portalier S.**, Candau J.N. and Lutscher F., A temperature-driven model of phenological mismatch provides insights into the potential impacts of climate change on consumer-resource interactions, *Ecography*, 2022(8): e06259, doi: 10.1111/ecog.06259
- 2022 **Portalier S.**, Cherif M., Fussmann G. and Loreau M., Inferring Size-Based Functional Responses From the Physical Properties of the Medium, *Frontiers in Ecology and Evolution*, 9: 761984, doi: 10.3389/fevo.2021.761984
- 2019 **Portalier S.**, Fussmann G., Loreau M. and Cherif M., The mechanics of predator-prey interactions: first principles of physics predict predator-prey size ratios, *Functional Ecology*, 33(2): 323-334, doi: 10.1111/1365-2435.13254. Haldane Price 2019
- 2016 **Portalier S.**, Cherif M., Zhang L., Fussmann G. and Loreau M., Size-related effects of physical factors on phytoplankton communities, *Ecological Modelling*, 323: 41-50, doi: 10.1016/j.ecolmodel.2015.12.003
- In press **Portalier S.**, Candau J.N. and Lutscher F., Climate change affects the outbreak frequency of a boreal forest defoliator through phenological mismatch, target journal: *Ecological Modelling*
- In review **Portalier S.**, Cherif M., Fussmann G. and Loreau M., Effects of physical factors on the size structure of food web modules, target journal: *Journal of Theoretical Biology*
- In review Cherif M., **Portalier S.**, Wain D., Arnott R., Brose U., Hirt M., Albert G., Berti E., Dyer A., Gauzens B., Ryser R., Pawar S., Hsi-Cheng H., Gupta A., Wootton K., Cirtwill A., Thébault E., The environment to the rescue: can physics help predict predator-prey interactions?, target journal: *Biological Reviews*
- In prep **Portalier S.**, Daufresne, T., Bottom-up stoichiometry at the base of the food-web: a resource-ratio approach applied to herbivore competition, target journal: *Ecology Letters*
- In prep **Portalier S.**, Dargent F., Forbes M., Mixed-species group formation as an antiparasite strategy: who benefits?, target journal: *The American Naturalist*

Data and code

- 2022 **Portalier S.**, Candau J.N. and Lutscher F., R code from: A temperature-driven model of phenological mismatch provides insights into the potential impacts of climate change on consumer-resource interactions, *Zenodo repository*, doi: 10.5281/zenodo.6392290
- 2022 **Portalier S.**, Cherif M., Fussmann G. and Loreau M., Data from: Inferring Size-Based Functional Responses From the Physical Properties of the Medium, *Zenodo repository*, doi: 10.5281/zenodo.5781790
- 2022 **Portalier S.**, Cherif M., Fussmann G. and Loreau M., Matlab code supplementing the article: Inferring Size-Based Functional Responses From the Physical Properties of the Medium, *Zenodo repository*, doi: 10.5281/zenodo.5781805
- 2018 **Portalier S.**, Fussmann G., Loreau M. and Cherif M., Data from: The mechanics of predator-prey interactions: first principles of physics predict predator-prey size ratios, *Dryad Digital Repository*, doi: 10.5061/dryad.8c40mbo
- 2018 **Portalier S.**, Fussmann G., Loreau M. and Cherif M., Source code from: The mechanics of predator-prey interactions: first principles of physics predict predator-prey size ratios, *Zenodo Repository*, doi: 10.5281/zenodo.1494252

SELECTED PRESENTATIONS

- 2021 Canadian Society for Ecology and Evolution Conference, University of British Columbia, BC, Canada
- 2021 Ecological Society of America meeting, Long Beach, CA, USA
- 2020 Ecological Society of America meeting, Salt Lake City, UT, USA
- 2017 CAMBAM seminar, McGill University, Montreal, QC, Canada
- 2016 Quebec Centre for Biodiversity Science Symposium, Montreal, QC, Canada
- 2016 Ecological Society of America meeting, Fort Lauderdale, FL, USA
- 2015 Quebec Centre for Biodiversity Science Symposium, Montreal, QC, Canada
- 2015 Ecological Society of America meeting, Baltimore, MA, USA
- 2015 CAMBAM seminar, McGill University, Montreal, QC, Canada
- 2014 Quebec Centre for Biodiversity Science Symposium, Montreal, QC, Canada

- 2014 Canadian Mathematical Society Symposium, Hamilton, ON, Canada
- 2014 Unifying Ecology across Scales, University of New England, Biddeford, ME, USA
- 2013 Quebec Centre for Biodiversity Science Symposium, Montreal, QC, Canada
- 2013 Canadian Society for Ecology and Evolution Conference, University of British Columbia, Kelowna, BC, Canada
- 2012 Quebec Centre for Biodiversity Science Symposium, Montreal, QC, Canada
- 2012 Metabolic Theory in Ecology, University of New England, Biddeford, ME, USA
- 2009 Herbivory Network, CEMAGREF, Montpellier, France

AWARDS AND FELLOWSHIPS

Principal applicant

- 2016 Centre for applied mathematics and bioscience in medicine (3, 000 CAD)
- 2016 Graduate excellence award in biology (3, 500 CAD)
- 2016 Graduate research enhancement and travel award (3, 000 CAD)
- 2015 Quebec centre for biodiversity science excellence award (2, 500 CAD)
- 2014 Graduate research mobility award in science (3, 000 CAD)
- 2014 Quebec centre for biodiversity science excellence award (2, 500 CAD)
- 2013 Graduate research enhancement and travel award (500 CAD)
- 2013 Graduate research mobility award in science (3, 500 CAD)
- 2011 Tomlinson Scientist Funding (20, 000 CAD)
- 2010 Provost's Graduate Fellowship (5, 000 CAD)

Collaborator

- 2019 Healthy Forest Partnership, Natural Resources Canada (150, 000 CAD)

Awards

- 2020 Haldane price (shortlisted): best paper of the year, first-authored by an early career researcher, for "The mechanics of predator-prey interactions: first principles of physics predict predator-prey size ratios", *Functional Ecology*

2014 Best poster: Quebec Centre for Biodiversity Science Symposium, Montreal, QC, Canada

PEER REVIEWS

Journals The American Naturalist
Ecology Letters
Scientific Reports
Ecological Modelling
Oikos
Hydrobiologia

LANGUAGES

English Fluent
French Mother tongue
Spanish Intermediate