Kimberly J. Gilbert | CV

Institute of Plant Sciences – University of Bern
Altenbergrain 21, 3013 Bern, Switzerland

kjgilbert.evolution@gmail.com • http://kjgilbert.github.io/

Population geneticist & evolutionary biologist

Employment

SNSF Ambizione Fellow **2020 – 2024**
University of Bern, Institute of Plant Sciences – 2020-2022 *Switzerland*
University of Fribourg, Department of Biology – 2022-2024

Post-doctoral Researcher **2019 – 2020**
University of Lausanne (UNIL), Dept. of Computational Biology *Lausanne, Switzerland*
Advisor: Prof. Dr. Christophe Dessimoz

EMBO Post-doctoral Fellow **2017 – 2019**
University of Bern, Institute of Ecology & Evolution *Bern, Switzerland*
Advisor: Prof. Dr. Laurent Excoffier

EEB Post-doctoral Fellow **2016 – 2017**
University of Toronto *Toronto, Ontario*
Advisors: Dr. Aneil F. Agrawal, Dr. Stephen I. Wright

Education

Ph.D. Zoology **Sep 2011 – Oct 2016**
University of British Columbia *Vancouver, British Columbia*
Advisor: Dr. Michael C. Whitlock
Dissertation title: Understanding local adaptation and effective population size in the face of complex demographic history

B.Sc. Biology **2006 – 2010**
University of Virginia *Charlottesville, Virginia*
Graduated with distinction, specialization in environmental & biological conservation

Publications

21. **Gilbert KJ**, Moinet A, Peischl S (2022) Gene surfing of underdominant alleles promotes formation of hybrid zones, *Philosophical Transactions of the Royal Society B*, 377(1846), 20210006, d doi: https://doi.org/10.1098/rstb.2021.0006
20. **Gilbert KJ**, Zdraljevic S, Cook DE, Cutter AD, Andersen EC, Baer CF (2022) The distribution of mutational effects on fitness in Caenorhabditis elegans inferred from standing genetic variation, *Genetics*, 220(1), iyab166 doi: https://doi.org/10.1093/genetics/iyab166
19. Altenhoff AM, Train C-M, **Gilbert KJ** , Mediratta I, Mendes de Farias T, Moi D, Nevers Y, Radoykova H-S, Rossier V, Warwick Vesztrocy A, Glover NM, Dessimoz C (2021) OMA orthology in 2021: website overhaul, conserved isoforms, ancestral gene order and more, *Nucleic Acids Research*, 49(D1), D373-379
18. Pouyet F, **Gilbert KJ** (2021) Towards an improved understanding of molecular evolution: the relative

roles of selection, drift, and everything in between, *Peer Community Journal*, 1:e27, doi: https://doi.org/10.24072/pcjournal.16

17. **Gilbert KJ***, Pouyet F*, Excoffier L, Peischl S (2020) Transition from background selection to associative overdominance promotes diversity in regions of low recombination. *Current Biology*, 30(1), 101-107.e3, *co-first authors

16. Peischl S, **Gilbert KJ** (2020) Evolution of dispersal can rescue populations from expansion load. *The American Naturalist*, 195(2), doi: https://doi.org/10.1086/705993 & available on BioRXiv: https://www.biorxiv.org/content/early/2018/11/30/483883

15. **Gilbert KJ**, Peischl S, Excoffier L (2018) Mutation load dynamics during environmentally-driven range shifts. *PLOS Genetics*, 14(9): e1007450. https://doi.org/10.1371/journal.pgen.1007450.

14. Antonovics J, Abbate J, Bruns E, Fields PD, Forrester N, **Gilbert KJ**, Hood M, Park T, Taylor DR (2018) Effect of the anther-smut fungus *Microbotryum* on the juvenile growth of its host *Silene latifolia*. *American Journal of Botany*, 105(6), 1088-1095.

13. Peischl S, Dupanloup I, Foucal A, Jomphe M, Bruat V, Grenier J-C, Gouy A, **Gilbert KJ**, Gbeha E, Bosshard L, Hip-Ki E, Agbessi M, Hodgkinson A, Vézina H, Awadalla P, Excoffier L (2018) Relaxed selection during a recent human expansion. *Genetics*, 208(2), 763-777.

12. **Gilbert KJ**, MC Whitlock. (2017) The genetics of adaptation to discrete heterogeneous environments: Frequent mutation or large effect alleles can allow range expansion. *Journal of Evolutionary Biology*, 30(3), 591-602. doi:10.1111/jeb.13029.

11. **Gilbert KJ**, NP Sharp, AL Angert, GL Conte, JA Draghi, F Guillaume, AL Hargreaves, R Matthey-Doret, MC Whitlock. (2017) Local maladaptation reduces expansion load during range expansion. *The American Naturalist*, 189(4), 368-380, doi:10.1086/690673.

10. **Gilbert KJ** (2016) Identifying the number of population clusters with STRUCTURE: Problems and solutions. *Molecular Ecology Resources*, 16(3), 601-603.

9. **Gilbert KJ**, MC Whitlock (2015) Evaluating methods for estimating local effective population size with and without migration. *Evolution*, 68(8), 2154-2166.

8. Santiso X, L Lopez, **KJ Gilbert**, R Barreiro, MC Whitlock, R Retuerto (2015) Patterns of genetic variation within and among populations in *Arbutus unedo* and its relation with selection and evolvability. *Perspectives in Plant Ecology, Evolution and Systematics*, 17(3), 185-192.

7. **Gilbert KJ**, MC Whitlock (2015) Q_{ST}-F_{ST} comparisons with unbalanced half-sib designs. *Molecular Ecology Resources*, 15(2), 262-267.

6. Caplins SA, **KJ Gilbert**, C Ciotir, J Roland, SF Matter, N Keyghobadi (2014) Landscape structure and the genetic effects of a population collapse. *Proceedings of the Royal Society B*. 281: 20141798; doi: 10.1098/rspb.2014.1798

5. Vines TH, AYK Albert, RL Andrew, F Débarre, DG Bock, MT Franklin, **KJ Gilbert**, J-S Moore, S Renaut, DJ Rennison (2014) The availability of research data declines rapidly with age. *Current Biology*, 24, 94-97.

4. Vines TH, RL Andrew, DG Bock, MT Franklin, **KJ Gilbert**, NC Kane, EJ Kleynhans, J-S Moore, BT Moyers, S Renaut, DJ Rennison, T Veen, S Yeaman (2013) Mandated archiving greatly improves access to research data. *FASEB Journal*, 27(4), 1304-1308.

3. **Gilbert KJ**, RL Andrew, DG Bock, MT Franklin, NC Kane, J-S Moore, BT Moyers, S Renaut, DJ Rennison, T Veen, TH Vines (2012) Recommendations for utilizing and reporting population genetic analyses: The reproducibility of genetic clustering using the program STRUCTURE. *Molecular Ecology*, 21(20), 4925-4930.

2. Keller SR, **KJ Gilbert**, PD Fields, DR Taylor (2012) Bayesian inference of a complex invasion history revealed by nuclear and chloroplast genetic diversity in the colonizing plant, *Silene latifolia*. *Molecular Ecology*, 21(19), 4721-4734.

1. Whitlock MC, **KJ Gilbert** (2012) Q_{ST} in a hierarchically structured population. *Molecular Ecology Resources*, 12(3), 481–483.

Awards & Funding

SNSF Ambizione Grant **2020 – 2024**
922,413 CHF

Honorable Mention – Best student paper, *The American Naturalist* **2018**
Gilbert et al. *2017*

EMBO Long-term Post-doctoral Fellowship **2017 – 2019**
143,400 CHF

Ecology and Evolutionary Biology Post-doctoral Fellowship **2016 – 2017**
University of Toronto $40,500 CAD Accepted in part

Declined **– NSF Post-doctoral Research Fellowship** **2016 – 2019**
National Plant Genome Initiative $210,000 USD

Cordula and Gunter Paetzold Fellowship **2015 – 2016**
University of British Columbia $18,000 CAD

Declined **– Zoology Graduate Fellowship** **2015 – 2016**
University of British Columbia $16,000 CAD

Ann and William Messenger Graduate Fellowship **2015**
University of British Columbia $700 CAD

Zoology Graduate Fellowship **2014 – 2015**
University of British Columbia $11,000 CAD

Frieda Granot Graduate Scholarship in Interdisciplinary Research **2013 – 2014**
University of British Columbia $200 CAD

Theodore E Arnold Fellowship **2013 – 2014**
University of British Columbia $7,750 CAD

Patrick David Campbell Graduate Fellowship **2013 – 2014**
University of British Columbia $8,050 CAD

Zoology Graduate Fellowship **2013 – 2014**
University of British Columbia $11,000 CAD

BRITE Fellowship **2011 – 2013**
University of British Columbia $21,000 CAD

Teaching Experience

IEcological Genomics **Spring 2020**
Lead practical sections (2) on teaching population genetic structure analyses *University of Bern*

Introduction to R Programming and Analyses **Fall 2018, 2019**
Teaching assistant for practicals in R for biology undergraduates *University of Bern*

Guest Lecture **– Introduction to Population Genetics** **May 2019**
Lecture on population structure, effective population size, & natural selection *University of Bern*

Molecular Population Genetics Practical **Spring 2018, 2019**
Teaching assistant for practicals in molecular data analysis for biology undergraduates *University of Bern*

Statistics for Biology **Spring 2017, 2018**
Teaching assistant for practicals in statistics for biology undergraduates *University of Bern*

Fundamentals of Biostatistics **Fall 2013, 2014, 2015**
BIOL 300 *UBC*

Statistical procedures for biological research; estimation, hypothesis testing, goodness of fit, analysis of variance and regression; use of computers for statistical analysis
Two sections (70 students total) in 2013, one section (36 students) in 2014, one section (36 students) in 2015.
Lab coordinator for 254 students enrolled in 2014 and for 275 students enrolled in 2015.

Guest Lecture **– Quantitative Methods in Ecology and Evolution** **January 2013**
BIOL 548 *UBC*
Guest lecture on making maps in R

Fundamentals of Evolutionary Biology **Fall 2012, Spring 2013**
BIOL 336 *UBC*
Discussion-based tutorial covers natural selection, population genetics, quantitative genetics, systematics, and classical and molecular approaches to the study of evolution
Three discussion sections of 45 students total per semester

Presentations & Workshops

Invited

The dynamics of underdominant alleles during species range expansions **Sep. 2020**
IRES Ecology-Evolution Seminar Series *Montpellier, France*

Drivers of Genetic Diversity in Regions of Low Recombination **Feb 2022**
ESEB meeting 'Disentangling neutral versus adaptive evolution in chromosomal inversions' *Tjärnö, Sweden*
Online Webinar, Emory College 'What is linked selection doing to populations' *Aug, 2020*
Department of Biology seminar series (online), Univ. of Florida *June, 2020*
Institute of Ecology and Evolution seminar series (online), Univ. of Bern *March, 2020*

Mutation load dynamics during environmentally-driven range shifts **Apr., Aug., Nov. 2018**
EAWAG Kastanienbaum - Aquatic ecology & macroevolution seminar series *Luzern, Switzerland*
"Evolution on the edge: eco-evolutionary dynamics" ESEB symposium *Montpellier, France*
Institute of Science and Technology (IST) Austria *Vienna, Austria*

Species range shifts and local adaptation **January 2018**
AndinA workshop *Bariloche, Argentina*
35-member international working group combining ecological and evolutionary disciplines to further understanding of range expansions and local adaptation

Local adaptation, expansion load, and mutation load **Sept., Oct. 2017**
University of Basel – Botanical Colloquium *Basel, Switzerland*
Uppsala University *Uppsala, Sweden*

The genetics of adaptation during expansion across heterogeneous environments **April 2017**
University of Zürich; Behaviour, Ecology, Environment, and Evolution Seminar Series *Zürich, Switzerland*

Local maladaptation reduces expansion load during species range expansion **July 2016**
CSEE "Theoretical ecology and evolutionary biology" symposium *St. John's, Newfoundland*

Data availability, archiving, and scientific reproducibility **June 2016**
American Society of Mammalogists Annual Conference *Minneapolis, MN*
''Big data meets mammalogy: how to find and share data" symposium

Estimating effective population size and the reproducibility of science **Feb. 2015, Dec. 2014**
Monash University *Melbourne, VIC, Australia*
Duke University Pop Bio Seminar Series *Durham, NC*

Reproducible Science Hackathon **December 2014**
NESCent Working Group *Durham, NC*
21-member working group aiming to develop a curriculum and workflow for teaching reproducible science

SimBank **November 2014**
NESCent Catalysis Meeting *Durham, NC*
25-member working group aiming to create a collection of openly available simulation results to facilitate testing of statistical population genetic and phylogeographic methods

Contributed (select)

What generates diversity in regions of low recombination? **2019**
Math & Computational Evolutionary Biology (MCEB) *Porquerolles, France*

Recovery from expansion load is limited during species range shifts **2017**
CeMEB Assembly: Biological invasions & range expansions from an evolutionary perspective *Tjärno, Sweden*

Mutation load across mating systems: how does load change and how is it best estimated **2017**
SMBE Meeting - talk *Austin, TX*
Evolution Meeting - talk *Portland, OR*

Local maladaptation reduces expansion load during species range expansion **2016**
Evolution Meeting - talk *Austin, TX*

Validating SNP loci underlying local adaptation in lodgepole pine **2015**
15^{th} ESEB Congress - poster *Lausanne, Switzerland*

Evaluating methods to estimate effective population size in the presence of migration **2014**
Evolution Meeting - talk *Raleigh, NC*
Evo-WIBO Conference (Evolutionary Biology in the Pacific Northwest) - talk *Port Townsend, WA*

Estimating effective population size in natural populations **2013**
Evolution Meeting - talk *Snowbird, UT*
SFU-UBC-UVic Ecology and Evolution Retreat - talk *Brackendale, BC*

Range expansion and adaptation across heterogeneous environments **2012**
Landscape Genetics Symposium, CIEE Graduate Mini-Course - talk *Toronto, ON*
Evo-WIBO Conference (Evolutionary Biology in the Pacific Northwest) - poster *Port Townsend, WA*

Inferred invasion history of *Silene latifolia* into North America **2011**
13^{th} ESEB Congress - poster *Tuebingen, Germany*
SFU-UBC-UVic Ecology and Evolution Retreat - poster *Brackendale, BC*

Volunteer & Outreach

Subject Editor **2018 – present**
Molecular Ecology, Molecular Ecology Resources

Reviewer: *American Naturalist*, *Biological Invasions*, *Biology Letters*, *Communications Biology*, *Conservation Biology*, *Ecography*, *Ecology and Evolution*, *Evolution*, *Evolution Letters*, *Frontiers in Plant Science*, *G3*, *Genome*, *Heredity*, *Molecular Ecology*, *Molecular Ecology Resources*, *New Phytologist*, *PeerJ*, *Proceedings B*, *TREE*, *Tree Genetics & Genomes*

IEE Junior Staff Seminar Series **2017 – 2019**
One of six junior staff organizing the invited lecture series in ecology and evolution

Symposium co-organizer **2018**
Joint 2018 ESEB-SSE-ASN-SSB meeting in Montpellier, France
Co-organized with Drs. Nathaniel Sharp, Frédéric Austerlitz, and Paul Verdu a symposium entitled “From theory to genome-wide data: inferring selection, demography, gene flow and admixture"

Graduate Student Council Member **2013 – 2016**
American Society of Naturalists
Council Chair for 2015-2016 term; member of workshops committee for ASN-sponsored workshops
Organized the student-mentor mixer at the 2016 Evolution Meeting in Austin, TX
Organized the student-mentor mixer at the 2014 Evolution Meeting in Raleigh, NC

Journal club organizer
UBC Evolution Discussion Group (EDG) weekly reading group **2014 – 2015**
Evolution discussion group at University of Bern, Institute of Ecology and Evolution **2017 – 2019**

Faculty Search Committee: Graduate Student Representative **2014**
Evolutionary biology CRC2 job search for the Department of Zoology, University of British Columbia

Volunteer mist-netting and bird banding **2013 – 2016**
Wild Research *Iona Island Bird Observatory, Vancouver, BC*
Participate in winter, spring migration, and fall migration bird monitoring
Teach proper bird handling, aging, data collection, and mist net extraction techniques to new volunteers
Assist in teaching other volunteers and visitors to the station about the species conservation and monitoring

Previous Research Experience

Independent Study & Research Technician **Sep. 2009 – June 2011**
University of Virginia
Genetic analysis of metapopulation processes in the *Silene-Micobotryum* host-pathogen system
Supervisors: Dr. Douglas R. Taylor, Dr. Peter D. Fields, Dr. Janis Antonovics

Field Technician & Research Assistant **May 2009 – August 2009**
Blandy Experimental Farm, University of Virginia
Field research on effects of tropospheric ozone on native vs. invasive tree species
Supervisors: Dr. David E. Carr, Dr. Eric E. Elton

MAPS Bird Banding Intern **May 2008 – August 2008**
Monitoring Avian Productivity and Survivorship – The Institute for Bird Populations
Mist-netting, banding, and processing passerines and near-passerines during summer breeding season to monitor populations of local species
Supervisor: James Junda, M.Sc.