Tom R. Booker

CONTACT INFORMATION
University of British Columbia, Vancouver
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https://tbooker.github.io/

EMPLOYMENT

University of British Columbia, Vancouver, Canada
- Bioinformatics Postdoctoral Fellow (Oct 2021 - October 2023)

University of Calgary, Calgary, Canada
- Postdoctoral Research Fellow (March - October 2021)
- Supervised by Professor Michael Whitlock and Associate Professor Sam Yeaman

University of British Columbia, Vancouver, Canada
- Postdoctoral Research Fellow (Sept 2018 - March 2021)
- Supervised by Professor Michael Whitlock and Associate Professor Sam Yeaman

EDUCATION

University of Edinburgh, Edinburgh, Scotland

PhD., Evolutionary Genetics, October 2014 - October 2018

- Thesis Title: UNDERSTANDING PATTERNS OF GENETIC DIVERSITY IN THE HOUSE MOUSE GENOME
- Supervisors: Professor Peter Keightley and Professor Brian Charlesworth
- Spring 2018: Visiting student at UBC hosted by Professor Sarah Otto

MSc., Evolutionary Genetics, 2013 - 2014 (Distinction)

- Thesis Title: SEARCHING FOR BALANCING SELECTION ON A MIMICRY SUPERGENE IN THE BATESIAN MIMIC *Papilio polytes*
- Supervisors: Professor Deborah Charlesworth and Rob W. Ness (Now Assistant Professor at University of Toronto - Mississauga)

University of Stirling, Stirling, Scotland

BSc Hons, Ecology, 2009 - 2013 (First Class)

- Dissertation Title: AN INVESTIGATION INTO THE FITNESS AND DISTRIBUTION OF A NEWLY DISCOVERED ALLOPOLYPLOID SPECIES, *Mimulus peregrinus*
- Supervisor: Dr Mario Vallejo-Marin
- 2011-2012: Study abroad at Simon Fraser University, Vancouver, Canada.

PUBLICATIONS

Preprints

Booker, T. R., Yeaman, S., & Whitlock, M. C. (*Submitted*). "Using genome scans to identify genes used repeatedly for adaptation."
Preprint online at: https://www.biorxiv.org/content/10.1101/2022.03.24.485690v1

Booker, T. R., Payseur, B. A., & Tigano, A. (*Accepted at Proc. Roy. Soc. B*). "Background selection under evolving recombination rates".
Preprint online at: https://doi.org/10.1101/2021.12.20.473549

Booker, T. R., Jackson, B., Craig, R., Charlesworth, B. & Keightley, P. D. (*In revision at Molecular Biology and Evolution*) "Patterns of genetic diversity around protein-coding exons and conserved non-coding elements are explained by strong selective sweeps in mice".
Preprint online at: https://doi.org/10.1101/2021.06.10.447924

Booker, T. R., Yeaman, S. & Whitlock, M. C. (*In revision at Molecular Ecology Resources*) "The WZA: A window-based method for characterizing genotype-environment association".
Preprint online at: https://doi.org/10.1101/2021.06.25.449972

Exposito-Alonso, M., **Booker, T. R.**, Czech, L., Fukami, T., Gillespie, L., Hateley, S., ... & Zess, E. (*Accepted at Science*). "Quantifying the scale of genetic diversity extinction in the Anthropocene."
Preprint online at: https://doi.org/10.1101/2021.10.13.464000

Published Papers

11. Grummer, J. A.*, **Booker, T. R.***, Matthey-Doret, R.*, Nietlisbach, P.*, Thomaz, A. T.*, & Whitlock, M. C. (2022). "The immediate costs and long-term benefits of assisted gene flow in large populations". *Conservation Biology*, e13911.
** Joint first author*

10. Lind, B. M., Lu, M., Vidakovic, D., Singh, P., **Booker, T. R.**, Yeaman, S., & Aitken, S. (2022). "Haploid, diploid, and pooled exome capture recapitulate features of biology and paralogy in two non-model tree species". *Molecular Ecology Resources*, 22: 225238.

9. **Booker, T. R.**, Yeaman S. & Whitlock M. C. (2021). "Global adaptation complicates the search for local adaptation". *Evolution Letters*, 5: 4-15.

8. **Booker, T. R.**, Yeaman S. & Whitlock M. C. (2020) "Variation in recombination rate affects detection of outliers in genome scans under neutrality". *Molecular Ecology*, 29: 42744279.
Highlighted on the cover and with a perspective piece

7. Byers K.A., **Booker T. R.**, Combs M., Himsworth C.G., Munshi-South J., Patrick D.M., Whitlock M.C.. (2020) "Using genetic relatedness to understand heterogeneous distributions of urban rat-associated pathogens". *Evolutionary Applications* 00: 112.

6. **Booker, T. R.** (2020) "Inferring parameters of the distribution of fitness effects of new mutations when beneficial mutations are strongly advantageous and rare".
G3: Genes, Genomes, Genetics, 10(7) 2317-2326

5. **Booker, T. R.**, & Keightley, P. D. (2018). "Understanding the factors that shape patterns of nucleotide diversity in the house mouse genome". *Molecular Biology and Evolution*, 35(12) 2971-2988

4. **Booker, T. R.**, Jackson, B. C., & Keightley, P. D. (2017). "Detecting positive selection in the genome". *BMC Biology*, 15:98.

3. **Booker, T. R.**, Ness, R. W., & Keightley, P. D. (2017). "The recombination landscape in wild house mice inferred using population genomic data". *Genetics*, 207(1) 297-309

2. Keightley, P. D., Campos, J. L., **Booker, T. R.**, & Charlesworth, B. (2016). "Inferring the frequency spectrum of derived variants to quantify adaptive molecular evolution in protein-coding genes of *Drosophila melanogaster*". *Genetics*, 203(2), 975-984.

1. **Booker, T.**, Ness, R. W., & Charlesworth, D. (2015). "Molecular evolution: breakthroughs and mysteries in Batesian mimicry". *Current Biology*, 25(12), R506-R508.

Equity, Diversity & Inclusion Activities

Panellist - Parenting in Academia
Discussion group in the Biodiversity Research Centre at UBC 2022

Member of Zoology Equity, Diversity and Inclusion (ZEDI) Committee at UBC 2022-*Present*

Participant - Indigenous Awareness
Organised by Indigenous Corporate Training inc. 2021

Participant - pgEd Webinar Series: History of Eugenics
Organised by the GSA 2021

Teaching Experience

Course Coordination

BIOL525D: Bioinformatics for Evolutionary Genetics 2020-2023
Upper division course at UBC on bioinformatics.
Website and course materials at: (https://ubc-biol525d.github.io/)

Teaching Assistance

Statistics and Data Analysis, MSc course 2014-2017
Upper division course, part of the MSc QGGA program at the University of Edinburgh

Population and Quantitative Genetics, MSc course 2015-2017
Upper division course, part of the MSc QGGA program at the University of Edinburgh

Ecology and Evolutionary Genetics, BSc course 2014-2015
Undergraduate course, offered at the University of Edinburgh

Student Supervision

A. Chhina - MSc Committee - Simon Fraser University 2022-*Present*

C. Atkinson - Directed studies co-supervisor 2019-2020
Undergraduate student at UBC

K.A. Byers - Bioinformatics/genomics mentor for PhD project 2018-2020
Now postdoctoral research fellow

S-A. Xerri - Master's project co-supervisor 2018
Now PhD student at the Max Planck Institute

C. Barata - Master's project co-supervisor 2017
Now PhD student at the University of St. Andrews

B. Lecher - Honour's project co-supervisor 2016-2017
Now Pre Doctoral Fellow at the European Bioinformatics Institute

Academic Honours and Awards

Runner up Harry Smith Prize - Molecular Ecology 2020
University of British Columbia - Bioinformatics Research Fellowship 2020
Registration Award - Society of Molecular Biology and Evolution 2019
Runner up Best student talk at Population Genetics Group 51 2018
Runner up Best student poster at Population Genetics Group 50 2017
Environment Yes! *Won regional heat - runner up at the national final* 2016

EASTBIO Doctoral Training Partnership Studentship	2014-2018
Genetics Society, Sir Kenneth Mather Memorial Prize	2013/2014
University of Edinburgh, Douglas Falconer Award, best MSc dissertation	2013/2014
Undergraduate Project Funding - Botanic Society of Scotland	2012
Undergraduate Project Funding - Society of Biology	2012
Nominated, Simon Fraser University Student Conservation Prize	2012

SERVICE & OUTREACH

Reviewing

Science, *PLoS Genetics*, *The Plant Cell*, *Molecular Biology and Evolution*, *Evolution*, *Molecular Ecology*, *Proceedings of the Royal Society B*, *New Phytologist*, *Genome Biology and Evolution*, *Ecology and Evolution*, *Frontiers in Zoology*, *Frontiers in Ecology and Evolution*, *Peer Community in Evolutionary Biology*, *G3*, *BMC Biology*

Academic Service

Member of the Molecular Ecology Junior Editorial Board	2021 - *Present*
Undergraduate Student Mentor *Society for Molecular Biology and Evolution*	2019 & 2021

Departmental Service

Postdoc representative on search committee for head of the BRC at UBC	2021
I organise Δ-tea, an evolutionary genetics discussion group at UBC	2021-*Present*
I hold bioinformatics office hours in the BRC at UBC	2020-*Present*
I ran virtual trivia nights for the BRC at UBC during the COVID-19 pandemic	2020-2021
Postdoc representative on expansion committee for the BRC at UBC	2020
Co-organiser of the Vancouver Evolution Group (VEG) *I stopped due to childcare out of work hours*	2019 - 2020
Organised the Classic Theory Journal Club at the University of Edinburgh	2017

Outreach

Skype a Scientist participant	2021
Essay judge for Canadian Undergraduate Research Competition (CURC)	2020-2021
Teen Nerd Nite High School Student Mentor	2020
Poster Judge BIOL 310 Animal Behaviour	2019
Poster and talk judge EcoEvo Retreat	2018-2019

INVITED PRESENTATIONS	2022	University of British Columbia, Biodiversity Research Centre, Canada
	2021	Universidad del Rosario, Faculty of Natural Sciences, Columbia
	2021	Monash University, School of Biological Sciences, Australia
	2021	Vitual SMBE 2021
	2021	Mooers lab group at Simon Fraser University, Canada
	2020	Introgression Discussion Group, UC Berkeley
	2015	Population Genetics Group 49, UK

CONTRIBUTED PRESENTATIONS	2022	PEQG, Asilomar, California (Talk)
	2021	EvolTree, Switzerland (Poster - Virtual)
	2021	BLISS, UBC, Vancouver, Canada (Talk)
	2021	Virtual EcoEvo Retreat, Canada (Talk - Virtual)
	2020	BLISS, UBC, Vancouver, Canada (Talk)
	2020	American Society of Naturalists (Talk)
	2019	EcoEvo Retreat, Canada (Talk)
	2019	BLISS, UBC, Vancouver, Canada (Talk)
	2019	SMBE, Manchester, UK (Poster)
	2018	EcoEvo Retreat, Canada (Talk)
	2018	Population Genetics Group 51, UK (Talk)
	2017	ESEB 2017, Netherlands (Poster)
	2017	Population Genetics Group 50, UK (Poster)
	2016	SMBE, Gold Coast, Australia (Talk)
	2015	SMBE, 2015, Vienna, Austria (Poster)
	2015	Quantitative Genomics, 2015, UK (Talk)

References

Professor Michael C. Whitlock
Postdoctoral Supervisor
Department of Zoology — E-mail: whitlock@zoology.ubc.ca
University of British Columbia

Professor Peter Keightley
PhD Supervisor
Institute of Evolutionary Biology — E-mail: peter.keightley@ed.ac.uk
University of Edinburgh

Assistant Professor Sam Yeaman
Postdoctoral Supervisor
Department of Biological Sciences — E-mail: samuel.yeaman@ucalgary.ca
University of Calgary

Representative Publications - *PDFs Included With Application*

Booker, T. R., Yeaman S. & Whitlock M. C. (2020) “Variation in recombination rate affects detection of outliers in genome scans under neutrality.”. *Molecular Ecology*, 29: 4274-4279.

Grummer, J. A.*, **Booker, T. R.***, Matthey-Doret, R.*, Nietlisbach, P.*, Thomaz, A. T.*, & Whitlock, M. C. (2022). “The immediate costs and long-term benefits of assisted gene flow in large populations”. *Conservation Biology*, e13911.
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