Tom R. Booker

CONTACT INFORMATION
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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 Samuel Yeaman

University of British Columbia, Vancouver, Canada
- Postdoctoral Research Fellow (Sept 2018 - March 2021)
- Supervised by Professor Michael Whitlock and Associate Professor Samuel 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
- I spent Spring 2018 as a visiting student at UBC hosted by Professor Sally 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
- Study abroad at Simon Fraser University, Vancouver, Canada. 2011-2012.

PUBLICATIONS

Papers in Revision

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

Grummer, J.*, Thomaz, A.* **Booker, T. R.***, Nietlisbach, P.*, Matthey-Doret, R.*, & Whitlock, M. C. (*In revision at Conservation Biology*) "Assisted gene flow is nearly always eventually beneficial, especially when genes are moved in small pulses".
** Joint first author*
Preprint online at: https://doi.org/10.1101/2021.04.20.440707

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

Published Papers

10. Lind, B. M., Lu, M., Vidakovic, D., Singh, P., **Booker, T. R.**, Yeaman, S., & Aitken, S. (2021 - *In press*). "Haploid, diploid, and pooled exome capture recapitulate features of biology and paralogy in two non-model tree species". *Molecular Ecology Resources*, 00, 1 14.

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 accompanying 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

2021 - Participant - *Indigenous Awareness* - Organised by Indigenous Corporate Training inc.
2021 - Participant - *pgEd Webinar Series: History of Eugenics* - Organised by the GSA

Academic Honours and Awards

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*	Sept 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
Funding for Undergraduate Summer Project: Botanic Society of Scotland and the Society of Biology	Summer 2012
Nominated, Simon Fraser University Student Conservation Prize	May 2012

Service & Outreach

Reviewing

Science, *PLoS Genetics*, *Molecular Biology and Evolution*, *Evolution*, *Molecular Ecology*, *Genome Biology and Evolution*, *Ecology and Evolution*, *Frontiers in Zoology*, *Peer Community in Evolutionary Biology*, *G3*, *BMC Biology*

Academic Service

2021 - *Present* - Member of the Junior Editorial Board at Molecular Ecology

2019 & 2021 Undergraduate Student Mentor for Society for Molecular Biology and Evolution

Departmental Service

2021 - *Present* - I organise $\triangle$-tea, an evolutionary genetics discussion group at UBC

2020 - *Present* - Bioinformatics office hours at UBC

2020-2021 I ran virtual trivia nights for my department at UBC during the COVID-19 pandemic

2020 Postdoc representative on department expansion committee for the Biodiversity Research Centre at UBC

2019 - 2020 I co-organised meetings of the Vancouver Evolution Group (VEG)
I stopped due to childcare out of work hours

2017 - I started and organised a journal club on classic population genetic papers at the University of Edinburgh in 2017

Outreach

2021 Skype a Scientist participant

2020-2021 Essay judge for Canadian Undergraduate Research Competition (CURC)

2020 Mentor for high school students during the Summer of 2020 - organised through Teen Nerd Nite

2019 Poster Judge BIOL 310 Animal Behaviour

2018-2019 Poster and talk judge EcoEvo Retreat

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

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*

Invited Presentations

August 2021 - Monash University, School of Biological Sciences Internal Seminar Series, *Online* (Talk)
Identifying the genetic basis of local adaptation and testing for convergent evolution across lineages

June 2021 - Vitual SMBE 2021 *Online* (Talk)
Background selection under evolving recombination rates

May 2021 - Mooers lab group at Simon Fraser University, Canada, *Online* (Talk)
The genetics of assisted gene flow

Contributed Presentations

March 2021 - EvolTree, *in silico*, Switzerland (Poster)
Identifying the genetic basis of local adaptation and testing for convergent evolution across

lineages

March 2021 - Virtual EcoEvo Retreat, *in silico*, Canada (Talk)
Background selection under evolving recombination rates

January 2020 - American Society of Naturalists 2020, Asilomar, USA (Talk)
Global adaptation confounds the search for local adaptation

October 2019 - EcoEvo Retreat, Squamish, Canada (Talk)
Leveraging linkage information in studies of local adaptation

September 2019 - BLISS, UBC, Vancouver, Canada (Talk)
Global adaptation confounds the search for local adaptation

July 2019 - SMBE, Manchester, UK (Poster)
Patterns of genetic diversity around protein-coding exons and conserved non-coding elements are explained by strong selective sweeps in mice

September 2018 - EcoEvo Retreat, Squamish, Canada (Talk)
Estimating the parameters of selective sweeps from patterns of diversity around functional elements in wild house mice Mus musculus castaneus

January 2018 - Population Genetics Group 51, Bristol, UK (Talk)
Estimating the parameters of selective sweeps from patterns of diversity around functional elements in wild house mice Mus musculus castaneus

August 2017 - ESEB 2017, Groningen, Netherlands (Poster)
Selective sweeps and background selection in the genome of wild house mice, Mus musculus castaneus

January 2017 - Population Genetics Group 50, 2017, Cambridge, UK (Poster)
Selective sweeps and background selection in the genome of wild house mice, Mus musculus castaneus

July 2016 - SMBE, Gold Coast, Australia (Talk)
Hill-Robertson Interference in wild mice, Mus musculus castaneus

December 2015 - Population Genetics Group 49, Edinburgh, UK (Talk - Invited)
Hill-Robertson Interference in wild mice, Mus musculus castaneus

July 2015 - SMBE, 2015, Vienna, Austria (Poster)
Selective sweeps and background selection in the genome of wild house mice, Mus musculus castaneus

May 2015 - Quantitative Genomics, 2015, London, UK (Talk)
Simulating genome evolution in the house mouse: understanding the contribution of Hill-Robertson interference to patterns of genetic diversity