

ADRIAN FORSYTHE Ph.D.

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AdrianForsythe

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RECENT EMPLOYMENT

Researcher Department of Systematics, Uppsala University 📅 February 2023 – Ongoing

- I am developing a web app that enables exploration of large transposable elements across fungal genomes. Available at: `starbase.serve.scilifelab.se`
- I have recently completed a large meta-analysis of RNAseq data in order to identify conditions that are associated with the transposition of transposable elements in pathogen genomes.

PostDoctoral Researcher Department of Zoology, Uppsala University 📅 Sept 2020 – Sept 2022

The goal of this research was to investigate the microbial ecosystems of populations in decline to understand how disruptions to microbial ecosystems can impact the function of the oral microbiome.

EXPERTISE & TECHNICAL SKILLS

Software Development

R python bash SQL SLURM git GitHub

- I use R and python for all downstream data processing, statistical analysis, (interactive) visualizations, and training of machine learning models.
- I work in unix-based HPC environments in order to manage high-throughput genomics datasets
- I aim to make my work as reproducible as possible.

Bioinformatics

RNAseq genome assembly variant calling metagenomics snakemake Nextflow

- I have a strong background in bioinformatic methods and best-practices related to the analysis of genomic, transcriptomic, and metagenomic sequencing data.
- These skills have allowed me to extract meaningful insights from complex biological datasets in the context of microbial ecology, evolution, and infectious disease control.

Data Analysis, Statistics, and Communication

dplyr lme4 tidymodels ggplot2 shiny
pandas matplotlib plotly dash scikit-learn django

- I have a deep understanding of statistical methods and algorithms relevant to the analysis of biological/bioinformatics datasets.
- I am skilled in integrating genomic data with existing biological datasets, providing an informed understanding of the monitoring and treatment of infectious diseases.
- I have a passion for using visualizations in communicating complex concepts to a broad audience.

EDUCATION

Ph.D. in Microbiology McMaster University, Department of Biology 📅 Sept 2016 – Aug 2020

Thesis title: Population Genetic Investigation of the White-Nose Syndrome Pathogen, *Pseudogymonascus destructans*, in North America

M.Sc. in Microbiology McMaster University, Department of Biology 📅 Sept 2014 – Aug 2016

Thesis title: Genetic and environmental influences on the germination of basidiospores in the *Cryptococcus neoformans* species complex

B.Sc. in Biology, Honours Trent University 📅 Sept 2010 – May 2014

COLLABORATIVE PROJECTS

Novel Data Streams to Track the Spread of Wildlife Disease **Research Project** 📅 2020-Ongoing

I led an effort to create a novel method for estimating levels of human activity at remote locations impacted by White-Nose Syndrome using public data. These data were used to model and predict the spread of WNS across North America.

Probiotic Prophylaxis to treat White-Nose Syndrome **Research Project** 📅 2019-Ongoing

My collaborators and I developed a probiotic treatment White-Nose Syndrome, a fungal disease in bats. Field trials are currently underway in British Columbia, Canada.

ACADEMIC CONTRIBUTIONS & SCHOLARSHIP



Academic Publishing Record

7 first-author papers. 139 citations, h-index = 7



Conference Organizer

I was the lead organizer for Ontario Ethology, Ecology, and Evolution 2019 conference, the largest graduate student-organized biology and psychology event in Ontario



Consultant

I was a consultant for the McMaster University chapter of the Society of Industrial and Applied Mathematics.



Academic Awards

- Joseph and Joanne Lee Ontario Graduate Scholarship 2019-2020.
- Luella K. Weresub Memorial Award for 2019 (Canadian Botany Association).
- Outstanding Research Publication in Ecology and Evolution for the 2018-2019 academic year (McMaster University).
- Outstanding Leadership Award for the 2018-2019 academic year (McMaster University, Department of Biology).
- Service to the Department Award during the 2017-2018 academic year (McMaster University, Department of Biology).



Recent Research Publications

- Gluck-Thaler, E., Forsythe, A., Puerner, C., Stajich, J. E., Croll, D., Cramer, R. A., & Vogan, A. A. (2024). Giant transposons promote strain heterogeneity in a major fungal pathogen. *bioRxiv*. doi:10.1101/2024.06.28.601215. eprint: <https://www.biorxiv.org/content/early/2024/06/28/2024.06.28.601215.full.pdf>
- Borry, M., Forsythe, A., Valtueña, A. A., Hübner, A., Ibrahim, A., Quagliarello, A., ... Bartholdy, B. P., et al. (2023). Facilitating accessible, rapid, and appropriate processing of ancient metagenomic data with amdirt. *F1000Research*, 12.
- Forsythe, A., Fontaine, N., Bissonnette, J., Hayashi, B., Insuk, C., Ghosh, S., ... Cheeptham, N. (2022). Microbial isolates with anti-*Pseudogymnoascus destructans* activities from western canadian bat wings. *Scientific Reports*.
- Moraitou, M. *, Forsythe, A. *, Fellows Yates, J. A., Brealey, J. C., Warinner, C., & Guschanski, K. (2022). Dental calculus metagenomics suggest that ecology, not host phylogeny, shapes the oral microbiome in closely related species. *MBE*.
- Forsythe, A., Vanderwolf, K. J., & Xu, J. (2021). Landscape genetic connectivity and evidence for recombination in the north american population of the white-nose syndrome pathogen, *pseudogymnoascus destructans*. *Journal of Fungi*, 7(3), 182.