Aryeh H. Miller

Computational Biologist

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Education

Aug 2020 – Present | **School of Medicine, Washington University in St. Louis**
PhD in Ecology and Evolutionary Biology

Aug 2016 – May 2020 | **University of North Carolina at Asheville**
BS in Biology with honors

Experience

2018 - 2020 | **Research Fellow – National Museum of Natural History, Smithsonian Institution**

- Designed, deployed, and executed a cost-efficient, high-throughput wet and dry lab pipeline to generate multi-locus genetic sequence data of vertebrate biodiversity in Vietnam.

Technical Expertise

Computing

- Programming, data manipulation and visualization in R and Python, including use of popular packages and libraries (e.g., Tidyverse, pandas).
- Statistical expertise in maximum likelihood estimation and Bayesian inference approaches, Markov models, multivariate and machine learning techniques (random forest, K-nearest neighbor, K-means clustering, decision trees, dimensionality reduction [PCA, LDA]).
- Genomic data analysis expertise in methods for whole-genome sequencing and assembly, variant calling (e.g., Trimmomatic, BWA, samtools, GATK, vcftools, bcftools), and phylogenomic inference (e.g., IQ-TREE, RevBayes, RAxML, SVDQuartets), as well as bioinformatic workflow management and engineering (Snakemake).
- High-performance computing (HPC) environment proficiency using bash, SLURM scripting, and docker images.

Wet-lab

- Experienced with laboratory genetics, including DNA extraction manual kits and the AutoGen® system, PCR, clean-up, gel electrophoresis, Sanger sequencing, and DNA quantitation with Qubit® 3.0.

Relevant Formal Coursework

- Big Data Science, Genomics, Bio-statistics, Population Genetics, Evolution, Cell Biology

Leadership and Teaching Experience

Fall 2021, 2023 | **Teaching Assistant (Bio 3501: Evolution), Washington University in St. Louis**

- Led weekly discussion sections where students would grapple with recent peer-reviewed articles in the evolutionary biology literature, graded exams and essays, and held weekly office hours and several exam review sessions to teach students.

2021-Present | **Mentor and Program Leader, The Young Scientist Program**

- Cultivating mentorship and teaching competencies by engaging St. Louis public high school students to hone their own knowledge of biology by conducting supervised original research and explore careers in STEM.

Selected Recent Honors and Awards

1. National Science Foundation Graduate Research Fellow Award Finalist (2020, 2021)

2. University Research Scholar, UNC Asheville (2020)
3. Bernhardt-Perry Award for Undergraduate Research, UNC Asheville (2020)
4. Smithsonian Institution Global Genome Initiative Award (2018)

Highlighted Publications

2023
1. **Miller, A. H.**, Stroud, J. T. & Losos, J. B. The ecology and evolution of key innovations. *Trends in Ecology and Evolution* **38,** 122–131 (2023).

2022
2. **Miller, A. H.** & Stroud, J. T. Novel tests of the key innovation hypothesis: Adhesive toepads in arboreal lizards. *Systematic Biology* **71,** 139–152 (2022).
3. Reynolds, R. G. *et al.* Phylogenomics and Historical Biogeography of West Indian Rock Iguanas (genus Cyclura). *Molecular Phylogenetics and Evolution* **174,** 107548 (2022).

2020
4. **Miller, A. H.** *et al.* Discovery of a new species of enigmatic odd-scaled snake (Serpentes: Xenodermidae: Achalinus) from Ha Giang Province, Vietnam. *Copeia* **108,** 796–808 (2020).

2019
5. **Miller, A. H.** *et al.* The complete mitochondrial genome of the critically endangered Lesser Antillean iguana (Iguana delicatissima; Squamata: Iguanidae). *Mitochondrial DNA Part B* **4,** 2479–2481 (2019).