

PERSONAL DETAILS

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EDUCATION

Ph.D. Biological Sciences Aug. 2017 - Aug. 2022

University of Arkansas, USA

Supervisor: Dr. Jeremy M. Beaulieu

Thesis Title: Hiding in plain sight: accounting for rate heterogeneity in trait evolution models

M.Sc. Evolutionary Biology and Ecology Aug. 2015 - Jul. 2017

University of Toronto, Canada

Supervisor: Dr. D. Luke Mahler

Thesis Title: The Effect of Congeners on Trait Evolution and Sexual Dimorphism in Lesser Antillean Anolis Lizards

B.Sc Biology and History Sept. 2010 - Jun. 2015

University of Toronto, Canada

PROFESSIONAL EXPERIENCE

Assistant Professor, Michigan Society of Fellows Aug. 2024 - present

University of Michigan, USA

Post-doctoral researcher, Schmidt Futures post-doctoral fellow Jan. 2023 - Dec. 2024

University of Michigan, USA

Post-doctoral researcher, Post-doctoral research associate Oct. 2022 - Dec. 2022

University of Tennessee, Knoxville, USA

PUBLICATIONS

1. Stepanova N, Boyko JD, Lin J, Davis Rabosky AR, and Rabosky DL. Punctuated Versus Gradual Shifts in the Multivariate Evolutionary Process: A Test With Paired Radiations of Scincid Lizards. *Systematic Biology* 2025;74:483–98.
2. Vasconcelos T, Weaver WN, Baumgartner A, Bugnaski Z, and Boyko JD. Automated extraction of leaf mass per area from digitized herbarium specimens. *New Phytologist* 2025.
3. Vasconcelos T and Boyko JD. mvh: An R tool to assemble and organize virtual herbaria from openly available specimen images. *Applications in Plant Sciences* 2025;13:e11631.
4. Boyko JD. SegmentR: Deep learning for automated segmentation with an R interface. *Ecological Informatics* 2025;103259.

5. Boyko JD. Automatic Discovery of Optimal Discrete Character Models. *bioRxiv* 2024:2024–11.
6. Boyko JD and Vasconcelos T. Rates of biome shift predict diversification dynamics in flowering plants. *bioRxiv* 2024:2024–6.
7. Boyko JD and O'Meara BC. dentist: Quantifying uncertainty by sampling points around maximum likelihood estimates. *Methods in Ecology and Evolution* 2024;15:628–38.
8. Boyko JD, Cohen J, Fox N, et al. An Interdisciplinary Outlook on Large Language Models for Scientific Research. 2023.
9. Hagen ER, Vasconcelos T, Boyko JD, and Beaulieu JM. Investigating historical drivers of latitudinal gradients in polyploid plant biogeography: A multiclade perspective. *American Journal of Botany* 2024:e16356.
10. Boyko JD, Hagen ER, Beaulieu JM, and Vasconcelos T. The evolutionary responses of life-history strategies to climatic variability in flowering plants. *The New phytologist* 2023.
11. Boyko JD, O'Meara BC, and Beaulieu JM. A novel method for jointly modeling the evolution of discrete and continuous traits. *Evolution* 2023.
12. Boyko JD and Beaulieu JM. Reducing the biases in false correlations between discrete characters. *Systematic biology* 2022.
13. Mortimer SME, Boyko JD, Beaulieu JM, and Tank DC. Synthesizing Existing Phylogenetic Data to Advance Phylogenetic Research in Orobanchaceae. *Systematic Botany* 2022;47:533–44.
14. Vasconcelos T, Boyko JD, and Beaulieu JM. Linking mode of seed dispersal and climatic niche evolution in flowering plants. *Journal of Biogeography* 2021;50:43–56.
15. Boyko JD and Beaulieu JM. Generalized hidden Markov models for phylogenetic comparative datasets. *Methods in Ecology and Evolution* 2021;12:468–78.
16. Nakov T, Boyko JD, Alverson AJ, and Beaulieu JM. Models with unequal transition rates favor marine origins of Cyanobacteria and photosynthetic eukaryotes. *Proceedings of the National Academy of Sciences* 2017;114:E10606–E10607.

AWARDS AND GRANTS

UM/OpenAI Collaboration Grant (Co-I) <i>\$50,000 USD</i>	2025
UMPDA Professional Development Award <i>\$250 USD</i>	2023
Journal of Biogeography Innovation Award <i>\$750 USD</i>	2022
Outstanding Graduate Student Research Award <i>\$1000 USD</i>	2021
American Society of Naturalists Travel Grant <i>\$500 USD</i>	2019
Distinguished Doctoral Fellowship <i>\$80,000 USD</i>	2017 - 2021
SGS Conference Grant <i>\$750 USD</i>	2017
Phylogenetic Symposium Travel Grant <i>\$400 USD</i>	2016

PROFESSIONAL SERVICE

SSE Symposium - AI in Evolutionary Biology (organizer)	2025
Virtual Workshop - The Future of AI for Freshwater Biodiversity Conservation (invited participant)	2025

BioBlend Workshop: Integrating Multimodal and Crowd-sourced Data for AI-Driven Biodiversity Monitoring and Conservation (organizer)	2024
MIDAS and Schmidt Futures AI in Science Colloquium (organizer)	2023

CODING AND HIGH PERFORMANCE COMPUTING

R	Advanced
Python	Advanced
Bash	Proficient
High Performance Computing	Proficient

SOFTWARE CONTRIBUTIONS

<i>SegmentR</i>	R package for image segmentation.
<i>mvh</i>	Assembling and organizing virtual herbaria
<i>corHMM</i>	Correlated Hidden Markov Models for comparative biology
<i>dentist</i>	Computing uncertainty by sampling points around maximum likelihood estimates
<i>hiSSE</i>	Hidden State Dependent Speciation Extinction models
<i>OUwie</i>	Continuous character evolution under Ornstein-Uhlenbeck (OU) models

COMPETITIONS AND DATA CHALLENGES

Japan Aerospace Exploration Agency (JAXA)	2023
<i>8th place</i>	

PEER REVIEW

Nature Communications, Systematic Biology, Evolution, Journal of Biogeography, Methods in Ecology and Evolution, New Phytologist, PNAS, PLOS Biology, PLOS computational biology, ProceedingsB

TEACHING

Instructor (Fall 2025) <i>BIO202: Biological Data Analysis and Programming</i>	University of Michigan
Invited talk (2025) <i>AI for Scientists and Engineers summer academy: Foundation Models</i>	University of Michigan
Invited talk (2025) <i>Tools and Technology Seminar: HHMs and antibiotic resistance evolution</i>	University of Michigan
Invited talk (2024) <i>Workshop Harmonizing Accumulation Modeling (WHAM)</i>	University of Bergen
Instructor (2024) <i>Stats Workshop: Phylogenetic Comparative Methods</i>	University of Michigan
Instructor (2024) <i>An Introduction to Generative AI Tools for Research</i>	University of Michigan

Instructor (2024) <i>Gans Foundation Student Workshop: Functional Morphology</i>	University of Michigan
Instructor (2024) <i>Phylogenetic Comparative Methods in R</i>	Boston University
Instructor (2024) <i>An Introduction to Generative AI Tools for Research</i>	University of Michigan
Instructor (2023) <i>Enhancing Professional Productivity with Generative AI</i>	University of Michigan
Teaching Assistant (2017-2022) <i>Evolutionary Biology</i>	University of Arkansas
Teaching Assistant (2016-2017) <i>Macroevolution</i>	University of Toronto
Teaching Assistant (2016-2017) <i>Biostatistics</i>	University of Toronto
Teaching Assistant (2015-2016) <i>From Genomes to Ecosystems in a Changing World</i>	University of Toronto
Teaching Assistant (2015-2016) <i>Adaptation and Biodiversity</i>	University of Toronto

PRESENTATIONS

1. Boyko, J.D., (2025) Automatic discovery of optimal discrete character models (Evolution: Oral presentation - International conference)
2. Boyko, J.D., Vasconcelos, T.N.C. (2024) Rates of biome shift predict diversification dynamics in flowering plants (International Botanical Congress: Oral presentation - International conference)
3. Cohen, Y., Rauch, A., Li, J., Modenesi, B., Boyko, J.D., Wang, Y., Byon, E., and Huan, X. (2023) Sparse Modeling of Wavelet Features for Fault Classification and Regression in Spacecraft Propulsion Systems (PHMAP: Poster - International conference)
4. Boyko, J.D., Hagen, E.R., Beaulieu, J.M., Vasconcelos, T.N.C. (2023) The evolutionary responses of life-history strategies to climatic variability in flowering plants (Botany: Oral presentation - International conference)
5. Boyko, J.D., O'Meara B.C., Beaulieu, J.M. (2023) A Novel Method for Jointly Modeling the Evolution of Discrete and Continuous Traits (Evolution: Oral presentation - International conference)
6. Boyko, J.D., Beaulieu, J.M. (2022) Reducing the biases in false correlations between discrete characters. (Evolution: Poster presentation - International Conference)
7. Boyko, J.D., Beaulieu, J.M. (2019) Quantifying the limits of our knowledge in phylogenetic comparative studies. (Quantitative Genetics Workshop: Oral presentation - International Workshop)
8. Boyko, J.D., Nakov, T., Alverson, A.J. and Beaulieu, J.M. (2019) Quantifying the limits of our knowledge in phylogenetic comparative studies. (Botany: Oral presentation - International Conference)

9. Boyko, J.D., Nakov, T., Alverson, A.J. and Beaulieu, J.M. (2019) Quantifying the limits of our knowledge in phylogenetic comparative studies. (Botany: Oral presentation – International Conference)
10. Boyko, J.D., Nakov, T., Alverson, A.J. and Beaulieu, J.M. (2018) Testing the signal of marine versus freshwater origins of photosynthetic eukaryotes. (Botany: Oral presentation – International Conference)
11. Boyko, J.D., Mahler, D. L. (2017) Testing for character displacement in Lesser Antillean anoles. (Atwood Colloquium: Oral presentation – Institutional Conference)
12. Boyko, J.D., Mahler, D. L. (2016) Character displacement in Lesser Antillean Anolis lizards. (Evolution: Oral presentation – International Conference)
13. Boyko, J.D., Mahler, D. L. (2016) Testing for repeated character displacement in Anolis lizards. (OE3C: Oral presentation – Provincial Conference)

REFERENCES

Dr. Jeremy Beaulieu

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