

Mary Burak

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EDUCATION

2016 - Pres. Yale University - New Haven, CT

PhD in Forestry and Environmental Studies

Advisor: Dr. Oswald Schmitz

2015 Providence College - Providence, RI

B.A. *magna cum laude* in Biology

- Member of the Providence College Liberal Arts Honors Program
- Saint Dominic Scholar

2014 The School for Field Studies, Center for Wildlife Management Studies

Semester abroad in Kimana, Kenya & Karatu, Tanzania

- Wildlife ecology and management, environmental policy/socioeconomic values
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GRANTS, FELLOWSHIPS, & AWARDS

2016 - 2021 National Science Foundation Graduate Research Fellowship (Pre-doctoral) (\$138,000)

2014 - 2015 Providence College Undergraduate Research Grant (\$500)

Urban landscape genetics of New England white-footed mice

2011 - 2015 Saint Dominic Scholarship, Providence College

2011 - 2015 Providence College Dean's List

RESEARCH EXPERIENCE

2015 - 2016 Yale University - New Haven, CT

Research Assistant with *Dr. Gisella Caccone* (Dept. of Ecology & Evolutionary Biology)

- Population and landscape genetics studies of the tsetse fly (*G. f. fuscipes*) in order to inform eradication efforts regarding this vector of sleeping sickness
- DNA extraction, sequencing, and analysis (microsatellites, mtDNA, ddRAD)
- Landscape resistance modeling to predict tsetse fly movement based on genetic-environmental correlations
- Large database organization: field data from >8,000 individual tsetse flies

Research Assistant at the DNA Analysis Facility on Science Hill

- Preparation, processing, and quality control of fragment analysis and DNA sequencing samples using a Sanger sequencing

2014 - 2015 Providence College - Providence, RI

Research Assistant, Undergraduate Researcher with *Dr. Jonathan Richardson* (Dept. of Biology)

- I lead the GIS analysis of urban population genetics of rats (*Rattus norvegicus*) in Salvador, Brazil. This necessitated the development of landscape resistance models to quantify rat movement in Brazilian slums, part of a larger public health initiative aimed at eradicating this vector of leptospirosis.
- I also contributed to an urban landscape genetics and population ecology study of white-footed mice (*Peromyscus leucopus*) via small mammal trapping and handling, collection and DNA extraction of tissue.

2014 The School for Field Studies - Karatu, Tanzania

Directed Research Assistant with John Mwamhanga, M.S.

- Assessment of the condition and conservation strategies of Buger Community Forest, Karatu District, TZ which included: fauna identification and sampling, assessment of anthropogenic and natural forest disturbance, community interviews, and focus group discussions

2013 Providence College - Providence, RI

Undergraduate Researcher with *Dr. Jack Costello* (Dept. of Biology)

- Biomechanics research to determine general animal motion trends in fluids (e.g.: leeches in water, birds in steady flight)

2011 - 2012 Friar Phage Hunters Laboratory, Providence College - Providence, RI

Student Research under the direction of *Dr. Nicanor Austriaco*, *Dr. Kathleen Cornely*, and through funding from the *Science Education Alliance*, *Howard Hughes Medical Institute* (Chevy Chase, MD)

- Study of the behavior and genetic sequence of novel mycobacteriophage JOB42
- DNA extraction, sequencing, and genome comparisons (Phamerator)

PUBLICATIONS

Richardson, J. L., **Burak, M. K.**, Hernandez, C., Shirvell, J., Mariani, C., Costa, F., Ko, A. I., Caccone, A. In Press. Fine scale patterns of movement and gene flow in Norway rat leptospirosis vectors in Salvador, Brasil. *Evolutionary Applications*.

Costa, F., Richardson, J. L., Dion, K, Mariani, C., Pertile, A. C., **Burak, M.**, Childs, J. E., Ko, A. I., Caccone, A. 2015. Multiple Paternity in the Norway rat, *Rattus norvegicus*, from Urban Slums in Salvador, Brazil. *Journal of Heredity*.

Pope, W. H., Bowman, C. A., Russell, D. A. Jacobs-Sera, D., Asai, D. J., Cresawn, S. G., Jacobs Jr., W. R., Hendrix, R. W., Lawrence, J. G., Hatfull, G. F., **Science Education Alliance Phage Hunters Advancing Genomics and Evolutionary Science**, Phage Hunters Integrating Research and Education, Mycobacterial Genetics Course. 2015. Whole genome comparison of a large collection of mycobacteriophages reveals a continuum of phage genetic diversity. *eLIFE*. 4: e06416.

PRESENTATIONS

- 2015 **International Association of Landscape Ecology, World Congress - Portland OR**
Sigma Xi: The Scientific Research Society at Providence College - Providence, RI
Poster Presentation: *Burak, M., Richardson, J., Costa, F., and A. Caccone. "Using GIS for Landscape Genetics of the Norway rat to improve Public Health Outcomes in Salvador, Brasil"*
- 2012 **Celebration of Student Scholarship and Creativity, Providence College - Providence, RI**
Poster presentation: *"Isolation and Characterization of a Novel Mycobacterial Phage, Job42, and the Annotation of Its Genome"*
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SKILLS

- **Software:** ArcGIS, Circuitscape, R statistical software (including packages: MEMGENE, ResistanceGA) MaxEnt modelling
- **Genetics:** DNA extraction, Sanger sequencing/fragment analysis, GenAIEx, Geneland, Genepop, BayesAss
- **Fieldwork:** Northeast United States, Kenya, Tanzania
- **Languages:** elementary Swahili, intermediate Spanish
- First aid/CPR certified