

# Curriculum Vitae

## Education

### Doctor of Philosophy

2018 – 2024 Tulane University, Department of Ecology and Biology

### Master of Science

University of Michigan – Ann Arbor - Major: Conservation Ecology

### Bachelor of Arts

University of Puerto Rico – Rio Piedras

- Major: Political Science (Magna Cum Laude)

## Skills

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<b>Leadership</b>	Effective communication, Decision-Making, Critical thinking, Team collaboration, Problem-solving, Adaptability
<b>Interpersonal Skills</b>	Mentoring, Cross-functional collaboration, Team-building, Conflict resolution, Stakeholder communication
<b>Programming/Interface Data/Web Reporting OS/Shell Experience Cloud Computing Data Wrangling and Visualization</b>	Python, Bash, Rust, SQL, LaTeX, Markdown Quarto, Shiny Linux, PowerShell, WSL CentOS 7 HPC <i>tidyverse</i> , <i>ggplot2</i> , Tableau

Version Control	Git and GitHub
Bioinformatic Tools	GATK, samtools, cutadapt, Trimmomatic, <i>phyloseq</i> and <i>microeco</i>

## Peer-Reviewed Publications and Pre-Prints

- Dong, C. M., **Aponte Rolón, B.**, Sullivan, J. K., Tataru, D., Deleon, M., Dennis, R., Dutton, S., Machado Perez, F. J., Montano, L., & Ferris, K. G. (2024, June 29). Short-term fluctuating and long-term divergent selection on sympatric Monkeyflowers: Insights from decade-spanning reciprocal transplants. <https://doi.org/10.1101/2024.06.26.600870>
- **Aponte Rolón, B.**, Arnold, A. E., Sánchez Juliá, M., & Van Bael, S. A. (2024, April 19). *Evaluating the Role of Endophyte-Rich Leaves in Protecting Tropical Trees Against a Generalist Herbivore and a Pathogen*. <https://doi.org/10.1101/2024.04.18.589827>
- **Aponte Rolón, Bolívar,** & Perfecto, I. (2023). Between two trees: Environmental effects of *I. micheliana* and *A. latifolia* on leaf litter ants in a coffee agroecosystem. *Ecosphere*, 14(2), e4442. <https://doi.org/10.1002/ecs2.4442>
- Dáttilo, W., Vásquez-Bolaños, M., Ahuatzin, D. A., Antoniazzi, R., Chávez-González, E., Corro, E., Luna, P., Guevara, R., Villalobos, F., Madrigal-Chavero, R., De Faria Falcão, J. C., Bonilla-Ramírez, A., Romero, A. R. G., De La Mora, A., Ramírez-Hernández, A., Escalante-Jiménez, A. L., Martínez-Falcón, A. P., Villarreal, A. I., Sandoval, A. G. C., ... MacGregor-Fors, I. (2020). Mexico's Ants: Who are They and Where do They Live? *The Bulletin of the Ecological Society of America*, 101(2), Mimuluse01666. <https://doi.org/10.1002/bes2.1666>
- Dáttilo, W., Vásquez-Bolaños, M., Ahuatzin, D. A., Antoniazzi, R., Chávez-González, E., Corro, E., Luna, P., Guevara, R., Villalobos, F., Madrigal-Chavero, R., Falcão, J. C. D. F., Bonilla-Ramírez, A., Romero, A. R. G., De La Mora, A., Ramírez-Hernández, A., Escalante-Jiménez, A. L., Martínez-Falcón, A. P., Villarreal, A. I., Sandoval, A. G. C., ... MacGregor-Fors, I. (2020). Mexico ants: Incidence and abundance along the Nearctic–Neotropical interface. *Ecology*, 101(4), e02944. <https://doi.org/10.1002/ecy.2944>
- Schmitt, L., **Aponte-Rolón, B.**, & Perfecto, I. (2020). Evaluating community effects of a Keystone Ant, *Azteca sericeasur*, on *Inga micheliana* leaf litter decomposition in a shaded coffee agro-ecosystem. *Biotropica*, 52(6), 1253–1261. <https://doi.org/10.1111/btp.12833>

## Software & Data

- **Aponte Rolón, B.**, Blake, R. E., Berys, C., Gum, J., & Wood-Charlson, E. M. (2025). esipDMP: Data Management for Success. <https://doi.org/10.5281/ZENODO.17252143>
- **Aponte Rolón, B.**, Kristy, B., & Benucci, G. (2025). BRCore: Provides a set of tools to process and analyze microbial data from Bioenergy Research Centers. Retrieved from <https://github.com/germs-lab/BRCore>. R package version 0.1.0, commit b3915756f8eef04947597359a2c365349c372a00.
- Rieke, M., & **Aponte Rolón, B.** (2025). Nplyr: A grammar of nested data manipulation. Retrieved from <https://jibarozzo.github.io/nplyr/>. R package version 0.3.0.

## Other Publications

- **Aponte Rolón, B.** (2023). High-Molecular-Weight SPRI-aided DNA extraction from Mimulus MimulusMimulus \* Mimulus Mimulus MimulusMimulusMimulus\* (Phrymaceae) leaf tissue. [dx.doi.org/10.17504/protocols.io.bp2l6xn8rlqe/v2](https://doi.org/10.17504/protocols.io.bp2l6xn8rlqe/v2)
- Pérez-Figueroa, O., & **Aponte Rolón, B.** (2020). Clashing Resilience: Competing Agendas for Recovery after the Puerto Rican Hurricanes • SftP Magazine. *Science for the People Magazine*, 23(1). <https://magazine.scienceforthepeople.org/vol23-1/clashing-resilience-competing-agendas-for-recovery-after-the-puerto-rican-hurricanes/>

## Professional Experience

Post-Doctoral Research Associate Jan-2025-Present

Department of Agricultural and Biosystems Engineering, Iowa State University, Ames, IA

- **Developed high-throughput, reproducible pipelines** for large-scale microbiome analysis, enabling robust identification of core and non-core microbial communities across multiple Bioenergy Research Centers (BRCs) using R, parallel computing, and high-performance cluster resources.
- **Author and maintainer of the “BRCore” R package.** Implemented novel methods for core microbiome extraction based on Bray-Curtis dissimilarity and abundance-occupancy modeling, now used as a foundational tool within the Inter-BRC Microbiome project.
- **Enabled cross-center, cross-crop comparative analyses** by standardizing data processing, quality control, and statistical workflows (e.g., ordinations, dbRDA), directly supporting multi-institutional collaboration and increasing analytical consistency.
- **Produced publication-ready visualizations and summary statistics** that revealed robust patterns of core microbial taxa and their ecological drivers, informing both experimental design and biological interpretation within the BRC network.

- **Demonstrated the ecological significance of core taxa**, quantifying their contribution to community dissimilarity and highlighting deterministic versus stochastic assembly processes in plant-microbe interactions.
- **Empowered team members and collaborators** by providing well-documented, reusable code, comprehensive reports, and training, thereby enhancing the overall reproducibility, transparency, and impact of the research program.
- **Accelerated research outputs and scientific communication**, delivering actionable insights and high-quality figures/tables for manuscripts, presentations, and stakeholder reports in the field of microbial ecology and bioinformatics.

Technical Lead & Platform Architect Jan-2025-Present

**Earth Science Information Partners - Data Stewardship Committee, Severna Park, MD**

- **Technical Lead & Platform Architect for ESIP’s “esipDMP: Data Management for Success”**, defined the Quarto-based site architecture and information model, organizing content into clear domains with sidebar search, global TOC, and page navigation for discoverability.
- **Built a clear, efficient front-end on Bootstrap**: customized CSS/SCSS and HTML components to establish consistent layout, typography, and reusable patterns that scale for an open-source community of data practitioners.
- **Operationalized, contributor-friendly workflows and deployment**: architected a GitHub Pages publishing pipeline with deterministic URLs, standardized outputs, and repo-actions/issue templates to streamline PRs and community feedback.
- **Led cross-community collaboration (ESIP Data Stewardship Committee)**, establishing review pathways and content stewardship practices while maintaining a continuously deployed high-signal community-owned public resource.
- **Standardized navigation and content templates to reduce contributor friction and maintenance overhead**, enabling incremental, peer-reviewed additions while preserving a stable, version-controlled site foundation.

Data Scientist 2018-2024

**Department of Ecology and Evolutionary Biology, Tulane University, New Orleans, LA**

- **Owned experimental design, data collection, analysis and interpretation for 3 research projects** focused on understanding the interactions of fungal symbionts, and host-associated genes, resulting in production of 2 peer-reviewed articles.
- **Developed R, Python, and Bash modules to process genomic and metagenomic data** by applying the DADA2 and USEARCH algorithms for novel fungal discovery.
- **Applied GLMMs, ANOVAs, and clustering algorithms (PCA, LDA) in R** to analyze biological datasets or 3 research projects.

- Executed processing workflows via SLURM on a HPC cluster environment.
- **Collaborated with a team of 6+ members** to develop workflows for troubleshooting genomic data processing pipelines with GATK tools; the resulting workflow is hosted on GitHub.
- **Enhanced R package function features to handle additional diversity measures**; forked and submitted pull request to the open-source “mirlyn” package.
- **Ensured data integrity and reproducibility of statistical analyses**; curated and prepared data for submission to public relational databases.
- **Cleaned, validated and submitted genomic data to public relational databases** NCBI and GenBank.
- **Managed genomic relational databases (100K+ rows and 10+ tables)** and documented data processing and dependencies on GitHub to ensure reproducibility of statistical analyses.
- **Developed and maintained training vignettes to increase team’s data analytics and bioinformatic core competencies** in R and Bash to operate in HPC cluster environment and Unix-like systems.
- **Communicated research outcomes to stakeholders and the scientific community** by presenting at 4 national and 2 international conferences.

Product Developer Jan. – May 2024

**Connolly Alexander Institute for Data Science, Tulane University, New Orleans, LA**

- **Developed and presented a proposal to enhance accessibility to data science tools like Tableau, R, and Python** for university students of all skill levels, utilizing public repositories to host shared resources and curricular materials.
- **Created and managed a GitHub Pages website for CAIDS, supporting curricular applications and offering accessible resources on data science**, including tutorials on version control and introductory R.
- **Led a team of 10 data research interns to develop data literacy workshops** for the broader student body, which grew social media engagement by 150%.
- **Facilitated and led team dynamics with agile strategies** to increase efficiency for the development of workshops and social media strategies.
- **Ensured transfer of knowledge and increased team core competencies** through internal workshops (e.g., introduction to Excel, Intro to Project Management).
- **Assessed the Data Ambassador Council’s impact on fostering a data-driven community** on campus and identified the need for enhanced team-building activities and a structured onboarding process to improve program effectiveness.

Coordinator Jan. 2023 – Jan. 2024

**Tulanians Who Enjoy R Coding (TWERC), Tulane University, New Orleans, LA**

- **Coordinated the R user group** at Tulane University with a membership of approximately 15 - 20 individuals.
- **Facilitated the development of 4-5 R programming language workshops per semester** where students and peers applied coding skills to enhance research methods and tools for academic and professional advancement.
- **Played a pivotal role in informing the state of data science literacy** of members to faculty and staff in order to expand official data science programs and course offerings.

Data Science Instructor Sept. – Dec. 2023

**Howard-Tilton Memorial Library, Tulane University, New Orleans, LA**

- **Developed and delivered virtual workshops and training material** about version control, data visualization, and R to an audience of 70+ people.
  - Introduction to R - 30+ participants.
  - Introduction to Data Visualization in R - 20+ participants.
  - Introduction to Version Control with Git and GitHub - 20+ participants.

Ecological Data Scientist Aug. 2015 – May 2018

**School for the Environment and Sustainability, University of Michigan, Ann Arbor, MI**

- **Led a team on a 4-month biological sample collection in Mexico**; designed experiments, coordinated sample QC, data collection, and exploratory data analyses in R.
- **Applied GLMMs, ANOVAs, and PERMANOVA analyses** to understand interactions of ants and leaf litter nutrients in the tropics; visualized results with “ggplot2” in R.
- **Results were published in two articles in high-impact, peer-reviewed journals** and presented at international conferences.

## Teaching Experience

**Tulane University 2018-2024**

**Instructor *Howard-Tilton Memorial Library, Tulane University, New Orleans, LA.***

- October 2023 | *Introduction to Version Control with Git and GitHub*. Developed by **B. Aponte Rolón**
- October 2023 | *Introduction to Data Visualization in R*. Developed by **B. Aponte Rolón**

- October 2023 | *Introduction to R, Part 1*. Developed by Mike Ellis and led by **B. Aponte Rolón**

#### **Teaching Assistant *Department of Ecology and Evolutionary Biology***

- Spring 2024 & Fall 2018 | **Diversity of Life - EBIO 1010**. Dr. Jelagat Cheruiyot
- Fall 2020 - 2023 & Spring 2019 | **Entomology – EBIO 4430/4431**. Dr. Jelagat Cheruiyot
- Summer 2023 | **Tropical Field Biology - EBIO 3780**. Dr. Sunshine Van Bael
- Spring 2023 | **Natural History of Louisiana - EBIO 2330**. Dr. Donata Henry
- Spring 2023 | **Theory and Methods in Ecology and Evolutionary Biology - EBIO 2020**. Dr. Donata Henry
- Spring 2022 | **Insects and Human Interactions – EBIO 2210**. Dr. Jelagat Cheruiyot
- Spring 2021 - Fall 2019 | **Plants and Human Affairs – EBIO 3180/3185**. Dr. Keith Clay
- Spring 2020 | **Plant Biology and Adaptation - EBIO 3590/3591**. Dr. Jelagat Cheruiyot

#### **University of Michigan 2016 - 2017**

- Fall 2017 | **NRE 509: Ecology: Concepts and Applications**. Dr. Sheila K. Schueller
- Fall 2016 | **ENVIRON 270: Our Common Future**. Dr. Ivette Perfecto

#### **Guest Lectures 2024**

- Fall 2024 | **BIO 395 Introduction to R Programming for Biologists**, Grinnell College

## Conference Presentations and Posters

**Aponte Rolón, B.** (2025 June). *Poster*. “From Granite to Meadow: How Host Genetics and Habitat Shape Foliar Endophyte Communities in Monkeyflowers”. Evolution 2025, Athens GA, USA.

**Aponte Rolón, B.** (2023 June). *Oral Presentation*: “Foliar fungal symbionts in sympatric yellow monkeyflowers along an elevational gradient”. Evolution 2023, Albuquerque, NM, USA.

**Aponte Rolón, B.** (2023 March). *Poster*: “The Influence of host genotype and leaf trait plasticity on foliar fungal endophytes of yellow monkeyflowers in Yosemite National Park, CA”. Collaborators: Kathleen Ferris & Sunshine Van Bael. Tulane Research, Innovation, and Creativity Summit (TRICS), Jung Hotel Grand Hall, New Orleans, LA, USA.

**Aponte Rolón, B.** (2022 July). *Oral Presentation*: “Interactions between functional leaf traits and foliar endophytes in the defense against natural enemies of tropical trees” (ID: 358). The 58th Meeting of the Association for Tropical Biology and Conservation (ATBC 2022), Cartagena de Indias, Colombia.

**Aponte Rolón, B.** (2022 May). *Poster*: “The Influence of host genotype and leaf trait plasticity on foliar fungal endophytes of yellow monkeyflowers in Yosemite National Park, CA”. Collaborators: Kathleen Ferris & Sunshine Van Bael. Yosemite Symbiosis Workshop. Wawona, CA, USA.

**Aponte Rolón, B.** (2020 July). *Graphical Abstract*: “Investigating trade-offs and complementarity between functional leaf traits and foliar endophytic fungi in the defense against plant enemies of tropical woody plants”. Collaborators: A. Elizabeth Arnold, and Sunshine Van Bael. The Mycological Society of America’s First Virtual Meeting, MSA 2020: Mycology from the Cloud (virtual).

**Aponte Rolón, B.** (2019 May). *Poster*: “Leaf and Root Endophytes of Mangroves in Southwestern Florida Everglades”. Collaborators: Mareli Sánchez Juliá, Edward Castañeda, John Kominoski, & Sunshine Van Bael. Florida Coastal Everglades LTER All Scientists Meeting. Fairchild Tropical Botanic Garden, Miami, Florida.

**Aponte Rolón, B.** (2017 October). *Poster*: “Quality of leaf-litter and ant assemblages in shade-grown coffee in Chiapas, Mexico”, Collaborator: Ivette Perfecto. Student Conference on Conservation Science-New York (SCCS-NY), American Museum of Natural History in New York City, NY, USA.

**Aponte Rolón, B.** (2017 July). *Poster*: “Impacts of quality of leaf-litter on ant assemblages in shade-grown coffee in Chiapas, Mexico”, Collaborator: Ivette Perfecto. 54th Annual Meeting of the Association for Tropical Biology and Conservation, “Ecological and Social Dimensions of Tropical Biodiversity Conservation”, Merida, Yucatan, Mexico.

**Aponte Rolón, B.** (2014 May). *Poster*: “El efecto del Curcumin en la señalización celular de Artritis Psoriática” [The Effect of Curcumin on cell signaling of Psoriatic Arthritis]. (With



Carrero Feliciano, Heysel M.; Hall Laureano, Stephanie; Montes González, Ingrid, PhD.) Annual poster presentation of the American Chemical Society, Puerto Rico Chapter, University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

## Seminars & Workshops

**Delegate** (Aug. Sept. 2014): “*Encuentro latinoamericano y caribeño: asamblea intermedia*”. [Intermediate Assembly of the *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*]. Quito, Ecuador.

**Delegate** (October 2013): “*Rumbo a la asamblea intermedia*”. Sponsored by the *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*. Santo Domingo, Dominican Republic.

**Organizer** (August 2013): “*Primer Encuentro Nacional de Educadores(as) Populares de Puerto Rico*”. Sponsored by *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*, Pontifical Catholic University of Puerto Rico, Ponce, Puerto Rico.

**Workshop Developer** (August 2013): “*Educación Popular y Liberación Nacional*” [Workshop on Popular Education and National Liberation] Sponsored by *La Nueva Escuela* at *Primer Encuentro Nacional de Educadores(as) Populares de Puerto Rico*. Pontifical Catholic University of Puerto Rico, Ponce, Puerto Rico.

**Facilitator & organizer** (March 2012): “*Sexto Campamento de Jóvenes: Educando para una nueva Patria*” [Summit on Popular Education Critical Ideologies, Racism & Xenophobia]. *La Nueva Escuela*, Peñuelas, Puerto Rico.

**Organizer** (March 2012): “*Debates y perspectivas en la construcción de una reforma universitaria inclusiva*”. Sponsored by Honors Program Student Association (AEPREH), University of Puerto Rico, Río Piedras Campus. Social Sciences Faculty, University of Puerto Rico, Río Piedras Campus, San Juan Puerto Rico.

**Round table** (July 2012): “Puerto Rico: a brief historical account”. Second International Summit “*Entre las Crisis y Otros Mundos Posibles*” of the Transnational Network of Other Knowledges. Sponsored by *Centro de Investigaciones y Estudios Superiores en Antropología Social* (CIESAS), CIDECI Las Casas/ UNITIERRA-Chiapas, San Cristóbal de las Casas, Chiapas, México.

**Workshop Developer** (September 2010): “*Taller de Educación Popular*” [Workshop on Popular Education]. *La Nueva Escuela* at The University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

**Workshop Developer** (May 2010): “*Taller de Educación Popular y el Movimiento Estudiantil*” [Workshop on Popular Education and the Student Movement]. *La Nueva Escuela* at The University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

## Grants and Fellowships

- **Department of Ecology and Evolutionary Biology**  
2020, 2021, 2022 *Tulane University, New Orleans, LA*  
Student Research Grant
- **Office of Graduate and Post-Doctoral Studies**  
2021-2022 *Tulane University, New Orleans, LA*  
OGPS Fellowship
- **Rackham Graduate School**  
2017 *University of Michigan, Ann Arbor, MI*  
Rackham International Research Award
- **Rackham Graduate School**  
2017 *University of Michigan, Ann Arbor, MI*  
Rackham Conference Travel Grant
- **Rackham Graduate School**  
2015 *University of Michigan, Ann Arbor, MI*  
Rackham Master Fellowship

## Awards & Honors

- **Exceptional Teaching of an Upper Level Course** May 2024  
*Steven P. Darwin Outstanding Teaching Assistant Award*  
*Tulane University, New Orleans, LA*
- **Summer Graduate Award** July 2023  
*The Connolly Alexander Institute for Data Science*  
*Tulane University, New Orleans, LA*
- **Travel Award** May 2022 & 2023  
*Graduate Studies Student Association*  
*Tulane University, New Orleans, LA*
- **Dean's Travel Award** May 2022 & 2023  
*School of Science and Engineering*  
*Tulane University, New Orleans, LA*
- **Jeffrey Lund Forest Ecology Award** April 2017  
*School for the Environment and Sustainability*  
*University of Michigan, Ann Arbor, MI*

- Annual award for academic excellence, research capability, and professional promise.