



# Blair Young

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## EDUCATION

2022 **B.S. Ecology, Evolution, & Natural Resources** - Rutgers University – New Brunswick, New Jersey

Undergraduate Research: Non-Target Lichen & Bryophyte Incidence  
Patterns and Diversity of NJ Woody Angiosperm Herbarium  
Specimens

Advisor: Lena Struwe

2024- **Graduate Program in Ecology and Evolution** - Rutgers University – New Brunswick, New Jersey

Advisor: Lena Struwe

## RESEARCH INTERESTS

Bryology; Bacterial Endophytes; Bacteria-Plant Mutualisms; Taxonomy &  
Systematics of Bryophytes; Evolutionary Processes in Plants; Plant Macroevolution;  
Collections-based Research; Botanical Biodiversity

## SKILLS

• Light Microscopy • Confocal Microscopy • Fluorescent Staining Techniques •  
Axenic Plant Culture • Plant Specimen Collections • Collection Curation •  
Symbiota Database • R Programming Language • Taxonomic Interpretation •  
Bryophyte Identification • Field Surveying

## ARTICLES

### Published

Chang X, Young B, Vaccaro N, Strickland R, Goldstein W, Struwe L, and White J.  
2023. Endophyte symbiosis: evolutionary development and impacts of plant  
agriculture. Grass Research 3:18.

### Accepted

Young B, Thiers B, Struwe L, and White J. 2025. Endophytic bacteria discovered in  
oil body organelles of the liverworts *Marchantia polymorpha* and *Radula*  
*complanata*. American Journal of Botany.



### In Preparation

Young B, Struwe L, and White J. (in prep.). Nitrogen-fixing bacterial endophyte cycling in the vasculature of mosses.

Young B and Struwe L. (in prep.). Non-Target Lichen & Bryophyte Incidence Patterns and Diversity of NJ Woody Angiosperm Herbarium Specimens.

Young B and Yatskievych G. (in prep.). The Biogeography of Ploidy & Reproductive Mode in the Xeric-Adapted Fern *Myriopteris alabamensis* (Buckley) Grusz & Windham.

## SCIENTIFIC PRESENTATIONS

Young B, Vaccaro N, Struwe L, and White J. A Potential Symbiosis of Nitrogen Fixing Bacterial Endophytes and Their Bryophyte Hosts. Botany 2023 conference, (Boise, Idaho), 22-26 July 2023. (presentation)

Vaccaro N, Young B, Struwe L, and White J. Novel Research into Bacterial Nitrogen Fixation in Vegetative Cells of Mosses and Liverworts. Botany 2023 conference (Boise, Idaho), 22-26 July 2023. (poster)

Young B. The Biogeography of Ploidy & Reproductive Mode in the Xeric-Adapted Fern *Myriopteris alabamensis* (Buckley) Grusz & Windham. Texas Plant Conservation Conference 2022 (Fort Worth, Texas), 14-15 August 2022. (poster)

Young B and Struwe L. Non-Target Lichen & Bryophyte Incidence Patterns and Diversity of NJ Woody Angiosperm Herbarium Specimens. Botany 2022 conference (Anchorage, Alaska), 24-27 July 2022. (presentation)

Young B. A Bryologist's Brochure: Mosses of New Jersey and Where to Find Them. New Jersey Natural Lands Trust Annual Report 2022. New Jersey Natural Lands Trust, NJDEP. (article)

## AWARDS & HONORS

2023 **A. J. Sharp Award**, research award for the best student paper at Botany 2023 in the Bryological/Lichenological Section for the "Bacterial Endophytes of Liverwort Oil Body Organelles" presentation, 25 July 2023.

2024 **ASPT Undergraduate Research Award**, research award for the undergraduate research "Non-Target Lichen & Bryophyte Incidence Patterns and Diversity of NJ Woody Angiosperm Herbarium Specimens".

2024 **Dean's Fellowship**, Rutgers University, fellowship funding one year of graduate school.



## RESEARCH EXPERIENCE

### 2021-2022 **Non-Target Lichen & Bryophyte Incidence Patterns and Diversity of NJ Woody Angiosperm Herbarium Specimens.**

Independent research project. Rutgers University, New Brunswick, NJ. Woody herbarium specimens were examined for occurrences of bryophyte and lichen epiphytes to develop a methodology for improving data resolution for and discovery of inadvertent cryptogam collections. This research was built on the foundation of the extended specimen concept (Lendemer et al. 2019), using pre-existing locality information on specimens hosting other organisms to add to the depth of data collections provide. Digitized specimen images were used to find occurrences of epiphytes and account for them much more feasibly than could be done in the past. This research is the first of its kind within the field of botany to tackle the problem of poor data resolution in under-collected groups.

Advisor: Lena Struwe.

### 2022 **The Biogeography of Ploidy & Reproductive Mode in the Xeric-Adapted Fern *Myriopteris alabamensis* (Buckley) Grusz & Windham.**

Professional Research Project. University of Texas Herbarium, Austin, Texas.

Examined spore samples from several hundred specimens of the fern *Myriopteris alabamensis* from Texas and the surrounding regions to assess the ranges of the sexual diploid and apomictic triploid lineages within the species complex. Due to apomictic reproduction being the cause of polyploidy in the group spore size and number per sporangium was used as an indication of ploidy. The rarer sexual diploid cytotype was confirmed to exist only in the Sierra Madre Oriental mountains in Nuevo Leon, Mexico.

Advisor: George Yatskievych


### 2023 **A Potential Symbiosis of Nitrogen Fixing Bacterial Endophytes and Their Bryophyte Hosts.**

Professional Research Project. White Lab, Rutgers University, New Brunswick, New Jersey.

Initiated an effort to catalogue and characterize occurrences of intracellular bacterial endophytes in specific bryophyte tissues across a diverse array of phylogenetically distinct species using light microscopy and various staining techniques.

Advisors: Lena Struwe and James White

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- 2023 **Endophytic Bacteria Discovered in Oil Body Organelles of Liverworts (Marchantiophyta).** Professional Research Project. White Lab, Rutgers University, New Brunswick, New Jersey.  
Focused on surveying phylogenetically distinct lineages of liverworts for occurrences of bacterial colonies within their oil body organelles. Used confocal microscopy with nucleic acid fluorescent staining techniques to verify the ubiquitous existence of bacterial colonies within oil body organelles in the majority of liverwort orders sampled.  
Advisors: Lena Struwe and James White
- 2023 **Bryophytes of Schrader's Pond.** Professional Research Project. Natural Heritage Program, NJDEP, New Jersey  
Catalogued bryophyte species present at a calcareous fen site culminating in a species list consisting of several S1 species including *Scorpidium cossonii*, a species I recommended be on the list of species of greatest conservation need for the State Wildlife Action Plan.  
Advisor: Jason Hafstad
- 2024 **Bryophytes of Wharton State Forest.** Professional Research Project. Natural Heritage Program, NJDEP, New Jersey  
Catalogued bryophyte species present at an old growth Red Maple/Black Gum swamp culminating in a species list consisting of four S1 species, two historical species (*Riccardia palmata* & *Frullania asagrayana*), and one new record for the state (*Cheilolejeunea unciloba*).  
Advisor: Jason Hafstad
- 2024 **Bryophytes of Norvin Green.** Professional Research Project. Natural Heritage Program, NJDEP, New Jersey  
Catalogued bryophyte species present at a post-glacial forested site with seeps, rock barrens, and waterfall streams culminating in a species list consisting of 115 of NJ's ~400 total bryophyte species including twelve S1 species, four historical species, and two new records for the state (*Chiloscyphus latifolius* & *Lejeunea lamacerina*).  
Advisor: Jason Hafstad
- 2025 **Endophytic Bacteria Discovered in Oil Body Organelles of the Liverworts *Marchantia polymorpha* and *Radula complanata*.** Professional Research Project. White Lab, Rutgers University, New Brunswick, New Jersey.  
Focused on two phylogenetically distinct lineages of liverworts for occurrences of bacterial colonies within their oil body organelles. Used




confocal microscopy with nucleic acid and peptidoglycan fluorescent staining techniques to further prove the ubiquitous existence of bacterial colonies within oil body organelles in the two study species.

Advisors: Lena Struwe and James White

## WORK EXPERIENCE

- 2021-2022 **Herbarium Intern**, Chrysler Herbarium, Rutgers University  
Collaborated with other interns in a team to incorporate a donated collection into the herbarium. Completed a bryophyte/lichen research project on their non-target occurrence on vascular specimens resulting in a report and presentation shown at Botany2022. Also collected bryophyte specimens for the herbarium.
- 2022 **Herbarium Intern**, University of Texas Herbarium, University of Texas at Austin  
Worked to digitize and transcribe collections as part of an NSF grant to digitize the vascular flora of Texas and Oklahoma under the Texas & Oklahoma Regional Consortium of Herbaria (TORCH). Also pursued a research project with the help of faculty to establish the range of the diploid cytotype of the fern *Myriopteris alabamensis*, resulting in a presentation of a poster at the Botanical Research Institute of Texas (BRIT).
- 2022 **Herbarium Volunteer**, Chrysler Herbarium, Rutgers University  
Curated the liverwort collection at Chrysler Herbarium to meet modern standards including reorganizing the order of specimens to reflect phylogeny, updating taxonomic nomenclature, and compiling an inventory of the collection.
- 2022 **Lab Volunteer**, White Lab, Rutgers University  
Provided bryophyte identification, specimen collection, and microscopy work for research in the White Lab for endophytic symbiosis research.
- 2022-2023 **Curatorial Assistant**, Chrysler Herbarium, Rutgers University  
Curated the moss collection at Chrysler Herbarium to meet modern standards including reorganizing the order of specimens to reflect phylogeny, updating taxonomic nomenclature, reidentifying specimens, and compiling an inventory of the collection.



2022-2023 **Laboratory Technician**, White Lab, Rutgers University  
Continued a research project studying occurrences of bacterial endophytes in the mosses and liverworts using staining procedures and light microscopy leading to the discovery of oil body organelles as sites of abundant bacterial endophytes. Worked with fluorescent staining and confocal microscopy to corroborate the presence of bacteria in liverwort oil bodies.

## TEACHING EXPERIENCE

2024 **Plant Diversity & Evolution (11:216:411)**, Grader, Rutgers University  
Graded class assignments for the fall semester.  
Advisor: Lena Struwe

2024 **Plant Diversity & Evolution Lab (11:216:412)**, Invited Lecturer, Rutgers University  
Led a lecture on spore-bearing land plants focusing on alternation of generations. Collected bryophyte, lycophyte, and fern specimens for presentation during class.  
Advisor: Lena Struwe

## MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Botanical Society of America, 2023-present
- Bryological and Lichenological Society, 2022-present
- American Fern Society, 2022-present
- American Society of Plant Taxonomists 2024-Present

## PROFESSIONAL EDUCATION

- Andrew's Foray Workshop 2023
- Crum Workshop 2024
- Crum Workshop 2025