

## “Connecting with Biodiversity Collections: Structure–Function Relationships and Morphological Evolution in Mosses”

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My research focuses on the development, evolution, and function of plant structures. I am inspired by morphological features that are used to distinguish species taxonomically and those that are important for reproduction. My research is connected with biodiversity collections as a source of genetic material for phylogenetic analyses, spores for growing experimental laboratory populations of live mosses, and specimens for generating morphological datasets. First, I will discuss my research studying the moss calyptra. This small cap of maternal tissue covers the offspring apex during critical developmental stages. I explore this maternal-offspring relationship using electron microscopy, chemical analyses, and physiology experiments. My research demonstrates that maternal mosses protect their offspring from dehydration stress using a waxy cuticle that is structurally specialized and functionally important for offspring survival, development, and fitness. Second, I will discuss my collaborative research studying morphological evolution and refining taxonomic concepts. Our research tests systematic concepts of mosses containing morphologically reduced taxa, which lack features traditionally used to infer evolutionary relationships. Using molecular phylogenetics we uncovered instances of convergent evolution at the family, genus, and species levels. These novel relationships led to our description of a new moss family and ongoing revisions to moss classifications. Finally, I will describe my future research and the role that biodiversity collections will play in these studies.

**RESEARCH TALK – Monday Feb 1; Room 27, Alumni Memorial Bldg; 3:20 – 4:20 PM.**