

February 29, 2020

Dear Committee Members:

It is a great pleasure to provide my very strong support of Shelly Gaynor for a Graduate Student Research Award from IAPT. Shelly is a very special student who shows unparalleled research dedication and a commitment to helping others. I guarantee this award would be put to excellent use.

Shelly is a very talented and hardworking student whom I first met when she was an undergraduate in the summer of 2017. She visited our lab and was a summer Research Experience for Undergraduate opportunities (REU) student. She worked very hard on a project involving niche modeling genome in an autopolyploid native to the eastern U.S., *Galax urceolata*. She worked very hard on a project—via her hard work over that summer she was able to produce a first-authored paper (now published in *American Journal of Botany*). That project influenced her PhD work (below). We continued to communicate regularly after that summer REU; we were thrilled that she applied to graduate school here at UF and has been working in the Soltis lab since August of 2018. She has continued her interest in polyploid evolution—as discussed in detail below, with a special interest in the *Galax* system.

Shelly's research interests are in plant evolutionary biology—with a special interest in genome doubling (polyploidy). Because of her background, Shelly is a highly focused and dedicated student—well beyond most students in maturity. She also has clear goals in terms of her Ph.D. research, as well as clear long-term career goals (work as a professor at a research university). In large part due to her background, Shelly is very self-motivated. Once we discuss a research avenue or consider new ideas garnered from recent research papers, she knows what needs to be done and goes after an idea or project with dogged determination. She has a passion for learning that I have rarely seen—always coming in with new ideas for research based on a paper she read or a lecture she attended. Importantly, she not only wants to excel, but she wants to help others whenever possible.

I stress that Shelly is very bright, very talented, and absorbs material quickly. She already had a strong background from her undergraduate research and multiple summer REUs. She is reading about research on plant evolutionary biology and genome doubling as fast as we can give her papers and is pursuing many other avenues of learning about the topic on her own. She is a master at coding and using R. She handles big data problems with ease and increases her skill set at an amazing pace. She is so talented that she has helped us put on niche modeling workshops at national meetings since she was an undergrad visitor to the lab. She now leads these efforts.

Shelly is also proposing cutting edge research. She wants to do something really special in the area of genome doubling. Shelly has an excellent understanding of some of the important research questions in genome doubling. She has worked hard to design an exciting project that addresses major unanswered evolutionary questions regarding the genomic consequences of autopolyploidy. Despite the explosion of interest in polyploidy (genome doubling) in recent years, there have been few studies focused on autopolyploids and almost none on naturally occurring autopolyploids—most “model studies” are on allopolyploids. Hence, a major plant speciation mechanism (autopolyploidy) has long been neglected in terms of research. Shelly wants to remedy that problem and hence will be contributing to a major gap in our understanding of plant speciation/evolution. Her research project is clever, cutting edge, and very doable, spanning population genetics to genomics.

*The Foundation for The Gator Nation*

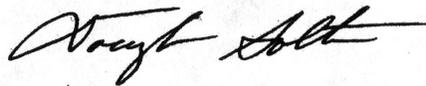
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Shelly is working on one of the best known autopolyploidy systems—*Galax urceolata*. Stebbins long championed *Galax* as the clearest example of autopolyploidy in nature. A series of studies has confirmed autopolyploidy in *Galax* and documented a large number of independent origins of the tetraploid. Elucidating the enormous success of autopolyploids (which we now know are quite common) must begin by addressing fundamental questions in a system such as *Galax*. Using this classic example of an undisputed autopolyploid and its diploid parent from nature, Shelly will address a series of novel questions not addressed previously in any autotetraploid system from nature. She proposes to provide the first insights into the genetic fates of multiple origins of the autotetraploid as well as a better understanding of the role of triploids in this system. To accomplish these goals, Shelly will employ cutting edge approaches.

Shelly is off to an amazing start in her Ph.D. program—hard to believe it has only been 1.5 years. She has already made enormous progress on a study of niche modeling in this system – she has already published those results as noted. Shelly has determined the populations that she will sample and located sources of living material that will be used for genome sequencing and assembly. She has also completed a phylogenetic study to place *Galax* in Diapensiaceae and clarify the closest relatives of the genus. Shelly has also been involved in two other side projects here at UF—papers will soon result from both efforts. She also has publications from her undergraduate work.

In summary, I give Shelly my strongest endorsement. Shelly’s study is an ambitious and important—we know little about autopolyploids—and no study has investigated the fates of independent autopolyploid origins. With her dedication, she is certainly poised to become a highly successful member of the scientific community. She has the talent and determination to make major contributions in plant biology as well as to teaching and mentoring. I should add that she is now teaching an undergraduate class largely on her own, “Florida Plants and Climate Change.” In addition, she works extremely well with others and consistently helps other students. She will put this award to superb use.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas Soltis". The signature is fluid and cursive, with a long horizontal stroke at the end.

Douglas Soltis  
Distinguished Professor  
Florida Museum of Natural History  
Department of Biology