

*W. Hardy Eshbaugh Graduate Student Research Grant*

**Katie Wenzell**

Northwestern University and Chicago Botanic Garden

Uniting molecular and morphological approaches to understand divergence in floral traits and species relationships in *Castilleja* (Orobanchaceae)

Amount awarded: \$1500

Thanks to funding from the W. Hardy Eshbaugh Graduate Student Research Award provided by ASPT, I was able to employ target enrichment sequencing to assess genome-wide divergence in two groups of *Castilleja* characterized by variation in floral color: the widespread *C. sessiliflora* and the more restricted *C. purpurea* species complex. Funding from ASPT allowed me to cover the cost of probes for target enrichment and Illumina platform sequencing for 72 individuals from 50 focal populations. The lab components of this work have been completed, and while data analysis is still being finalized, early results from this work were presented at the 2020 Botany Virtual Conference. Using target enrichment techniques, we identified evidence of genomic divergence among floral color morphs in *C. sessiliflora*, indicating the possibility of genetic isolation among nearby populations that differ in floral color. In contrast, a lack of genome-wide differentiation among the species of the *C. purpurea* complex suggest that divergence in color may be due to recent selection with ongoing gene flow, though additional work is planned to further explore these findings.

*William R. Anderson Graduate Student Research Grant*

**Keir Morse**

California Botanic Garden / Claremont Graduate University

Diversification and the role of hybridization in the genus *Malacothamnus* (Malvaceae)

Amount awarded: \$1500

My research on the systematics of the genus *Malacothamnus* is ongoing with a current emphasis on measuring specimens for morphological analyses and preparing my third lane of 96 samples for DNA sequencing. The ASPT research grant helps support the preparation and sequencing of this lane, which will include all remaining unsequenced taxa in the genus presumed to be extant, increased sampling of geographic variation of some previously included taxa, and several putative hybrid combinations.



*Shirley and Alan Graham Graduate Student Research Grant*

**Daniel Turck**

University of Idaho

Investigating the phylogeography of temperate rainforest and maritime alpine plants in the northwestern North America

Amount awarded: \$1500

I used the funds from this grant exclusively to pay for gas in order to reach my field sites to collect plant tissue samples in ID, MT, OR, WA, and BC. In total, I was able to sample 400+ specimens of my study species (hiking around 450 miles in the process).

Currently, my project is ongoing. I am preparing DNA libraires from my specimens and expect to get preliminary data back starting early next year.

*Rogers McVaugh Graduate Student Research Grant*

**Kelly Carscadden**

University of Colorado Boulder

Resolving hybridization dynamics of *Potentilla* across the Continental Divide

Amount awarded: \$1500

ASPT generously supported my ongoing study of the population dynamics of hybridizing *Potentilla* (cinquefoils, Rosaceae) across environmental gradients in the Rocky Mountains. In summer 2020, I completed my third and final annual survey of survival, growth, and reproductive output of approximately 600 tagged plants at the Niwot Ridge LTER and Rocky Mountain Biological Laboratory in Colorado. This past year, ASPT funds allowed me to determine the ploidy of hybrid and parent specimens using flow cytometry, in advance of genetic work. With the ASPT grant, I have prepared a ddRAD-seq library of 96 parent and putative hybrid individuals to validate hybrid identification and clarify whether hybrids interbreed with parent taxa. I am awaiting sequencing results after COVID closures of lab and sequencing facilities. Together, demographic and genetic data will shed light on the forces shaping population dynamics of hybrid *Potentilla* plant lineages and the likely impacts of hybrids on parent populations as environments change.



## Annelise Frazão

Universidade de São Paulo

Phylogeny, taxonomic revision, floral evolution and biogeography of *Tanaecium* Sw.  
(Bignoniaceae, Bignoniaceae)

Amount awarded: \$1200.00

The awarded funds provided by the ASPT was crucial for me to be able to accomplish the taxonomic part of my study. I used it to fund visits in Colombian herbaria (COL & JBG) and a visit to the herbaria MO (Saint Louis, U.S.A.) over the last summer, covering the airplane tickets and personal daily expenses in Colombia and Saint Louis. Also, because I was in the U.S.A., the funding allowed me to participate for the first time in the Botany conference (Botany 2019), in which I participated with a poster presentation ([click here](#) to see the abstract). The possibility to visit the cited herbaria allowed me to finish two papers: (1) the updated synopsis for the genus *Tanaecium* [[Phytokeys](#)] and (2) a new combination in the genus *Fridericia* [[Phytotaxa](#)]. Beyond this, I was able to finish and defend my Ph.D. thesis in August 2019 ([click here](#) to access it) and to finish collecting data for a paper about the typification of the genus *Tanaecium*, which will be submitted to the journal TAXON.



**Maria Beatriz de Souza Cortez**

University of Florida

Elucidating the floristic history of Brazil's campos rupestres to help preserve its future

Amount awarded: \$1200

I received funding early in 2019 to conduct field work in Brazil and during the Fall semester I started the process of obtaining a permit to collect my taxa of interest, Begonia Sect. Tetrachia. I received the permit in March of 2020 and was preparing for my trip when the COVID19 pandemic started. As a result, my institution banned all non-essential travel and I was not granted a travel authorization. Moreover, the US government has suspended travels from and to Brazil since the end of May and has not revoked this measure. Thus, I have not been able to conduct the research for which I received funding. Because the scenario is still uncertain regarding reopening of borders, my plans are to ask for herbarium samples and apply the money to pay for mailing fees of specimens and samples and for laboratory costs (probe capture and sequencing). Thus, if ASPT is in agreement, I would like this to be considered an interim report while I make advances in the project following the plan explained above. I appreciate your understanding and will wait for a response before I apply the funding received. My proposed plan would still permit me the opportunity to make maximum use of this award. Thanks for your support and help in these uncertain times.

## **Glen Morrison**

University of California Riverside

Biogeography of the manzanitas; insights on the origin of plant diversity in the California Floristic Province.

Amount awarded: \$1200

These funds supported field trips to collect samples of *Arctostaphylos pungens*. These collections focused on the coastal region of the California Floristic Province. These samples are being processed in lab to generate DNA extractions and sequencing libraries to produce data for analyses. Full analysis of these samples will be completed once more samples are collected, including many from Mexico that are being funded from a separate, subsequent grant we secured for this project.



**Yi Huang**

University of California, Riverside

Species delimitation in *Arctostaphylos*

Amount awarded: \$1200

This ASPT grant funded my ongoing project that aims to delimit species within the genus *Arctostaphylos*. The fund from this grant covered the expense of car rental, lodging, meals, and ice supply for my eight-day field trip to the California Central Coast and Bay area. In this trip, we obtained floral and leaf tissue of 126 samples from 26 *Arctostaphylos* taxa, recorded the coordinates of their localities, and collected herbarium vouchers. Currently, we are working on DNA extraction and ddRAD-seq library preparation of these collected samples. We hope to finish analyzing the data and publish the results within a year.



## **Justin Williams**

University of Colorado at Boulder

### Phylogenetic reconstruction of Hawaii's endemic mints

Amount awarded: \$1200

The funds granted by ASPT directly supported field work and herbarium studies. For five months in Fall of 2019 I conducted field work on the islands of Hawai'i, Maui, O'ahu, and Kaua'i, in close collaboration with the State of Hawaii's Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW), and the Plant Extinction Prevention Program (PEPP). Field work yielded hundreds of leaf samples and voucher specimens, and additionally, the support of ASPT directly funded visits to both the herbarium at the National Tropical Botanic Garden (PTBG) and the Bishop Museum Herbarium (BISH), allowing for diligent and detailed examination of many historic and type specimens. The molecular results of this work strongly support a need for taxonomic revision, illuminate patterns of biogeography, and provide hope for the use of molecular systematics to refine our understanding of imperiled evolutionary lineages before they are lost. A manuscript for this project is currently being prepared for submission.

## Harpo Faust

University of Idaho

A Vascular Flora of the Selkirk Mountains, Bonner and Boundary County, Idaho

Amount awarded: \$1200

With the funds I was able to fund travel to my field sites in the 2019 season. Due to the size of my study area, just under 900 square miles, and the lack of road access, funding gas was a central need of the project. My project is currently ongoing and now in its second and final season this year, and will culminate this fall 2020. In 2019 I was able to make 2,103 vascular plant collections in the Selkirk Mountains of Idaho that help fill the gap in our understanding of this rugged mountain range. So far in the 2020 field season I have been able to collect just shy of 2,000 collections. Included in both seasons collections are 4 state collection records and a current estimate of around 30 county collection records. Along with historic collections of the area I will be able to compile a more comprehensive vascular flora for the mountain range, which in tandem helps the broader understanding of the diversity of Northern Idaho. Additionally, I have added to an ongoing silica library at my host herbaria of almost all the vascular plant species of my study range, already utilized by other graduate students.



## Lindsey Riibe

University of Florida

West Indian *Polystichum* (Dryopteridaceae): Evolution in a Neotropical Island System

Amount awarded: \$1200

The funds from this award will support fieldwork in Puerto Rico, a trip which has been delayed due to COVID-19. Despite this interruption, I've made progress towards the larger project including fieldwork in the Dominican Republic, visiting herbaria (NY, VT), receiving specimen loans (NY, GH) and sequencing of 450 nuclear loci of 16 different species and several suspected hybrids—the data of which I am currently analyzing. While in the Dominican Republic, I co-taught a fern and lycophyte identification workshop for ca. 20 college students. Colleagues at the University of Puerto Rico (Río Piedras and Mayagüez campuses) and I have organized a similar workshop and I am hopeful that I will be able to put the ASPT award towards completing fieldwork and this *mini-curso* in Puerto Rico in the near future.



**Nora Gavin-Smyth**

Chicago Botanic Garden & Northwestern University

Phylogeography of Tanzania's Eastern Arc *Impatiens*

Amount awarded: \$1200

I used ASPT funds awarded for this project to travel to Tanzania in December 2019 until March 2020. I did field work in four Eastern Arc Mountain blocs: Nguru, Uluguru, Mahenge, and Rubeho. I collected nearly 200 specimens of various angiosperms, about 50 specimens of *Impatiens*, and I collected leaf material from *Impatiens* populations for molecular genetic analyses. Funds were used for transportation, paying field assistants and guides, paying forest service fees and COSTECH permit fees. Currently, the project is ongoing—I am currently analyzing target enrichment data of *Impatiens* sequences from specimens I collected in March 2019, which is helping me establish a workflow for 2019-2020 samples analysis. I employed a Tanzanian field botanist and mentored a Tanzanian undergraduate student from University of Dar es Salaam, who accompanied us on field work.

## **Sylvia Kinosian**

Utah State University

### Genus-level targeted enrichment in ferns

Amount awarded: \$1200

I am currently working on bait design for target sequence capture in the fern genus *Ceratopteris*. I have been working with Pteridaceae transcriptomes to design baits; ideally, such baits would not only be useful in *Ceratopteris*, but other members of this large family as well. With my ASPT funds, I was able to travel to the Field Museum and Missouri Botanical Gardens to collect additional samples of *Ceratopteris*, as well as cover shipping and administrative costs for specimens sent from Kew Gardens. I am currently working obtain samples of the newly discovered *C. shingii* Y. H. Yan & R. Zhang, which is thought to be the earliest diverging member of the genus. With the publication of the *C. richardii* genome sequence, a fully-resolved phylogeny is more important than ever to place this important genus and relevant species in evolutionary context.