

Dear members of the search committee,

Thank you for taking the time to consider my application for the Plant Evolutionary Biologist position in the Department of Plant Biology, Ecology, and Evolution at Oklahoma State University. After reading through the solicitation, I am confident that my familiarity with the region, my research on plant evolution as well as my commitment to education, collaboration, and increasing diversity in STEM make me well suited for this position.

My research broadly centers on understanding the processes that lead to the convergent evolution of traits. Specifically, I investigate *how* and *why* belowground bud placement in plants evolved. I test hypotheses regarding plant evolution and diversification at both broad (e.g., all monocots) and shallow phylogenetic scales using publicly available data, novel phylogenomic datasets, and field/greenhouse observations. The contributions of plants' belowground traits to their evolution and ecology remains understudied (excluding fine roots) but is an active and growing area of research. Over the next 5 – 7 years, my research program will focus on: (1) investigating the ecological and evolutionary importance of plants' belowground diversity, (2) assessing the significance of the bulbous habit to plant evolution, and (3) improving our understanding of African plant diversity and evolution through international collaborations. My research program includes museum- and field-based observations, experimental studies, and bioinformatics, and is inclusive to both undergraduate and graduate trainees.

In terms of teaching, I am prepared to offer Plant Evolution, Plant Diversity and Systematics, Biogeography, Practical Phylogenetics, and Introductory Biology. I am well equipped to produce both majors and non-majors as well as online versions of several of these courses. I am currently developing Evolutionary Horticulture, a course that blends the basics of horticulture and botany into a cohesive setting. Lastly, I would be thrilled for the opportunity to offer field-based inquiry courses, such as a study abroad or immersion course on Plant Evolution/Ecology in Zambia or Desert Biodiversity courses in the deserts of the USA or Namibia.

My experience motivating and leading collaborations coupled with my existing network of national and international scientists makes me well suited to immediately begin testing hypotheses on plant evolution at Oklahoma State University. I believe my current successes highlight my ability to be both a leader and collaborator, necessary characteristics when working with a diverse team and student body. Given the opportunity, I look forward to further discussing what I will bring to your institution.

Sincerely,



Cody Coyotee Howard, Ph.D.

My research broadly centers on understanding the processes that lead to the convergent evolution of traits, and how this relates to disparities in species richness across habitats. I use bioinformatic and phylogenetic methods to understand plant evolution at both broad (e.g., monocots; Howard et al., 2019, 2020) and shallow phylogenetic scales (e.g., *Ledebouria*; Howard et al., 2021). I also regularly leverage publicly available datasets to test and generate hypotheses on plant evolution and diversification (Howard & Cellinese, 2020). Overall, **my research combines phylogenetics, ecology and morphology to understand plant evolution**. I am especially fascinated by the many ways that plants have evolved belowground bud placement (i.e., geophytism), a geographically, morphologically, and phylogenetically diverse habit.

Geophyte ecology and morphology – Potato, taro, onion, and ginger are commonly encountered geophytes. This growth habit is ubiquitous in the monocots and is accomplished through different morphologies (Fig. 1), each of which have evolved multiple times. To investigate the evolution of this diversity, I used a phylogenetic sampling of almost 13,000 monocots coupled with geophytic trait and climate data, and found that geophytes inhabit cooler, drier climates *and* exhibit higher rates of diversification (Howard et al., 2019, 2020). I also found higher diversification rates in lineages with derived geophytic traits (i.e., bulb, corm, tuber), which inhabit overall drier, cooler climates relative to non-geophytes and rhizomatous taxa. Overall, these findings suggest that belowground morphological evolution may have been driven by adaptation to different climatic niches.

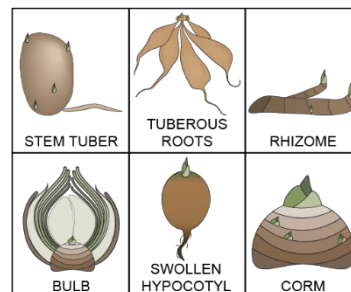


Figure 1. Geophyte trait diversity.

Bulbous monocot ecology – Leaves have been molded by evolution into an extraordinary number of unique structures and functions, such as the Venus flycatcher trap, the spines of cacti, and an onion's many layers. The bulbous habit, where resources are stored in swollen leaf bases, has evolved *at least* 11 times in the monocots and is rarely lost once evolved. To increase our understanding of the ecological significance of this trait, I measured bulb diameters from 2,500+ digitized herbarium specimens of 115 taxa and gathered flower phenology data for 88 taxa (Howard & Cellinese, 2020). A novel pattern emerged, which is that bulb size appears to have two optimal diameters. Variation in bulb size may also be co-opted for different ecological strategies. Specifically, I found that hysteroanthous taxa (flowering *without* leaves present) have larger bulbs overall compared to synanthous taxa (flowering *with* leaves present). My results suggest that different phenological strategies may influence selection on bulb size, a hypothesized relationship that had not yet been tested.

Contrasting histories of African plants –Africa houses an enormous diversity of habitats and plants, including geophytes. I aim to understand the intertwined nature of these habitats and the disparity in species and lineage richness across them. Relevant research projects include: 1) the first phylogenomic insights into the Ledebourinae, a group of bulbous monocots found throughout seasonal habitats in Africa, 2) the historical biogeography of tropical sub-Saharan African *Asplenium*, the most species rich fern lineage in Africa, but one whose diversity is greater in the non-African tropics, and 3) the use of publicly available datasets to understand diversification across plant lineages and habitats in Africa.

FUTURE RESEARCH

Geophyte evolution (NSF DEB SBS) – The complex evolution of belowground bud placement remains obscured due to a lack of studies on trait morphology as well as ambiguous or incorrect trait classification. One aspect of my research program is to continually build a holistic understanding of geophyte evolution using museum and field specimens, experimental manipulations, and phylogenetics. This includes detailed characterizations of belowground morphology, a severely overlooked portion of plant evolution. By not including the belowground morphology of plants into evolutionary and ecological studies, we are missing a critical piece of the puzzle. The Agavoideae+Scilloideae+Brodiaeoideae clade are excellent for studying both the conserved and not-so-conserved evolution of traits. For example, the Agavoideae have experienced multiple shifts from succulents/rhizomes to bulbs, whereas all taxa in the Scilloideae and Brodiaeoideae have bulbs and corms, respectively. This presents a unique system to study the evolutionary and ecological tradeoffs between above- and belowground traits. To promote this kind of research, I founded GOOPhy (**G**eophytic **O**rganisms – **O**ntology & **P**hylogeny) (www.geophytes.com), an international community of scientists whose goals are understanding the relationship between plant form and function. GOOPhy aims to provide resources (Howard et al., 2021; Tribble et al., 2021) and foster a collaborative research space.

Bulb evolution (NSF DEB EP) – As a part of GOOPhy, one focus will be building an international network of researchers interested in bulb evolution. Externally, bulbs look similar, but there are at least five different morphologies. Additionally, bulbous monocots each have clade-specific geographies, niches, etc., and many are sister to a relatively species-poor rhizomatous lineage. To generate preliminary data of the factors driving bulb evolution and subsequent lineage diversification, I am comparing the niche space of sister bulbous and rhizomatous lineages. This project will test hypotheses regarding the repeated shift from a rhizomatous to bulbous habit across monocotyledonous taxa by gathering detailed information on habitat, morphology, and phylogeny. Furthermore, I am gathering detailed morphological data across bulbous monocots that will be used to investigate hypotheses of allometry and how individual components of the bulb relate to ecology.

African plant evolution – Repeated and contrasting species richness patterns in plants can be found across sub-Saharan Africa. Many lineages have diversified within the seasonal habitats of Africa, but evidence of their respective diversification in similar habitats outside of Africa is sparse. Conversely, many pantropical lineages have lower species richness in tropical Africa compared to the Neotropics or Southeast Asia (i.e., the “odd man out” pattern). Interestingly, many lineages span the seasonal and tropical ecosystems of Africa, but despite this, they are consistently less diverse outside of their “main” habitat on the continent. To understand why such disparity exists, I will study lineages that have complementary and potentially intertwined biogeographical histories. For example, the Ledebouriinae (Asparagaceae) grow predominantly in seasonal and arid habitats of Africa, from which they have dispersed multiple times *out of*. In contrast, epiphytic *Asplenium* (ferns) grow mostly in tropical forests and have dispersed *into* Africa multiple times. I plan to continue to construct comprehensive phylogenies of predominantly African plants for testing hypotheses on the relationship between niches, traits, diversification, and biogeography. This work will involve building new collaborations with African colleagues and students as well as expand upon current partnerships with African researchers.

TEACHING PHILOSOPHY

As an educator, I draw upon my experiences as a fitness instructor to suit the needs of a diverse classroom. Group fitness attendees enter the room with varying levels of athleticism. A good instructor not only demonstrates the “difficult” exercises, but also provides modifications for those who may not be able to safely execute the more strenuous routine. Doing this allows all attendees to achieve a sufficient workout. When I started teaching at the collegiate level, I quickly realized that a classroom setting is no different. In the classroom, I strive to provide equitable opportunities for information comprehension and retention using tested pedagogical techniques in addition to creating an inclusive classroom atmosphere. Techniques I frequently use include multimodal learning environments and flipped classroom models, both of which provide students varied opportunities to connect with the information as well as other students in the course.

AS AN EDUCATOR

Adopting teaching practices that include *all* students is at the forefront of my teaching philosophy. I strive to accomplish this by presenting information through a variety of formats within a collaborative and inclusive setting. I begin each class with a story that is relevant to the topic of the day/week. I believe this helps students connect with the new information being introduced by showing them how what they are learning is applied outside of the classroom. Additionally, I provide topically relevant resources, such as videos, blogs, and podcasts, on the course website and in the syllabus, and promote them during lecture. I give low-stakes, informative assessments throughout the semester to better inform my teaching and highlight concept misunderstandings. I also periodically solicit anonymous feedback on my teaching style, likes and dislikes of the course, and what more/less of students would like to see. Additionally, I use a mixture of lecture-style presentations incorporated with active learning activities. For example, to “show” and simplify natural selection I used a game of Telephone, where students at one end of the room were shown a creature that I drew, and each subsequent student had 1 minute to redraw the creation they had just seen. Each change of hands signified an event, such as climate change or a meteor strike, and at the end we discussed the many scenarios that may have led to each row’s resulting species (e.g., genetic drift). In larger classroom settings, I have used Kahoot! quizzes after presenting a new section of content to reinforce the information just introduced. I also make all course materials readily available for students to download in order to accommodate as many students’ learning styles as possible. I strive for each lecture to be different by using a variety of methods to present information in order to appeal to a diversity of learning styles.

In biology major and non-major courses, I believe it is important to get students out of the classroom to reinforce concepts, and I am happy that the Department of Plant Biology, Ecology, and Evolution has existing resources that will facilitate such opportunities (e.g., McPherson Preserve). I have been fortunate to help co-develop a Desert Biodiversity immersion course at the University of Florida (#UFDesertBio2018/2020; <https://www.inaturalist.org/projects/uf-desert-biodiversity>) with Dr. Norman Douglas. In the course, we used an inquiry-based approach where, prior to the field portion of the course and in groups, students virtually explored the areas we would visit, queried iNaturalist for organisms of interest, and curated a list of potential organisms we could see. They presented their findings to the class and provided information on how to identify common species, rare ones to look out for and where they might be seen. In the

field, each student cataloged organisms using iNaturalist, digitally journaled of their experiences, and gave final presentations on the results of a simple research question they investigated while in the field. These low-stakes projects gave students ownership over their education, promoted course buy-in, and kept them engaged while in the field.

Online courses are increasingly becoming a vital resource for education, especially for non-traditional and disabled students. As a teaching assistant for an online biology course, I got to witness firsthand how an effective online course is designed, and I realized both the benefits and challenges that come with such courses. To improve my capabilities of creating effective online courses, I participated in an online course design program. To reinforce the concepts I was learning, I took an active role in adding to the Canvas site for a non-major botany course I was teaching at the time. I added visually appealing course pages and included topically relevant information for each week such as videos and websites. I look forward to learning more about online course creation and implementing this knowledge into my own course(s), if given the opportunity.

As methodologies and student populations continuously change, so must I. Therefore, I continually implement up-to-date pedagogical practices as the research necessitates. One pedagogical method I would personally like to begin implementing in larger classroom settings is the two-staged collaborative exam. This approach has students first take the exam individually, then students form groups to take the same exam collectively. Students receive immediate feedback through student-to-student teaching, which helps improve knowledge retention. In smaller classes (< 25 students), I would like to implement a lecture-lab hybrid teaching approach, where students are introduced to the material for the day while simultaneously observing actual living specimens. Hands-on activities have been shown to increase concentration in the classroom, and this hybrid approach reinforces course concepts by allowing direct observation of the discussion topic. I am familiar with this approach since I assisted in Medical & Forensic Botany, a course which uses this hybrid style.

COURSES

At the Oklahoma State University, I would be prepared to teach Plant Evolution, Plant Diversity and Systematics, Biogeography, Practical Phylogenetics, and Introductory Biology (majors and non-majors versions for some). I am also equipped to create online courses on several of these topics. With my background in horticulture, I would like to teach courses that span both horticultural and botanical disciplines. For example, I am currently developing a hybrid, lecture-lab Evolutionary Horticulture course that introduces students to horticultural techniques and crops while learning about plant evolution and morphology. Additionally, I would advocate for an immersion semester program (<https://biology.ufl.edu/immersion-semester/>). Having taught two Desert Biodiversity immersion courses as a graduate student, I have witnessed the personal growth and organismic knowledge that students gain during such an experience, and I would like to continue to offer these experiences to students. Lastly, I am highly motivated to develop an international field course in Zambia (Mutinondo Wilderness) or Namibia (Gobabeb) as well as a local field course.

I condemn racism, sexism, homophobia, and all forms of discrimination. Even as a member of the LGBTQ+ community, I recognize the privileges associated with being a white man, and when possible, I strive to use this position to the benefit of others. As a graduate student, during faculty job hires I have spoken up when discussions of candidates turned inappropriate, and I have called out faculty who made public and degrading comments towards other students. Experiences like these have undoubtedly had a profound effect on me, and therefore, I continually aim to build inclusive settings.

As an undergraduate at the University of Arkansas I was fortunate to be mentored by someone who I personally identified with, a gay man. Our working relationship began by discussing both of our goals to gain maximum benefit from the collaboration. In doing so, we collectively tailored the project(s) to both parties' benefit. This experience has led me to implement similar practices. For example, after taking on a student for wet lab assistance, I soon learned of her true passion: science writing. We then decided to reroute her attention towards creating science articles on my research. This relationship resulted in her teaching me the rigors of public science writing, and I teaching her about plant evolution. Her efforts resulted in her being selected for a science writer position at the Florida Museum of Natural History, and she is currently Communications Specialist at the University of Florida. Looking back at my undergraduate training I now understand the value of having diverse identities reflected in faculty composition since it allows students to interact with others like them as well as see themselves in similar positions.

Adopting teaching practices that include *all* students is at the forefront of my teaching philosophy. I strive to accomplish this by presenting information through a variety of formats. I provide visual aids *and* discuss these in detail so that both auditory and visual learners maximize the information being processed, and I provide relevant websites, videos and podcasts so that information can be absorbed through a variety of mediums. I make course content readily available for students to download and study at their own convenience. I also proudly display my true personality and self to foster a relaxed setting so that students feel safe to also be their authentic selves. In doing so I hope to create a positive climate that creates an engaged and comfortable audience for discussions, presentations, etc. As methodologies and student populations continuously change, so must I. Therefore, I continually implement up-to-date pedagogical practices as the research necessitates.

I strive to ensure that everyone's voices are heard and have wholeheartedly adopted this philosophy in all roles I have undertaken. As President of the Biology Graduate Student Association at the University of Florida, I designed, implemented, and presented data on the first departmental climate survey. Additionally, I co-facilitated departmental townhall-style meetings to encourage graduate student participation, I organized the first International Potluck, and I founded an international and gender-diverse team of botanists (GOOPhy). I also actively serve as the Public Relations DEI Liaison for the American Society of Plant Taxonomists. These endeavors highlight my ability and desire to be an inclusive leader and collaborator.

My story has been one of relatively good fortune, but not all historically excluded people can say the same. These disparities motivate me to create safe and welcoming shared environments. I actively use my place of privilege to amplify the needs and ensure the safety of others. I feel my identity and experiences have shaped me into being an inclusive teacher, mentor, and collaborator, but I recognize this is an ongoing process and we must all continually check our biases and call out the problematic actions of others.

Cody Coyotee Howard

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EDUCATION

- 2020 Ph.D. Botany — University of Florida
 Faculty supervisor: Dr. Nico Cellinese
 Dissertation: Evolutionary insights into monocotyledonous geophytes
- 2009 B.S. Horticulture Science, German minor — University of Arkansas, Fayetteville
 Advisor: Dr. Jon T. Lindstrom (deceased)

PROFESSIONAL EXPERIENCE

- 2020 – Postdoctoral Research Associate — University of Florida
 Faculty supervisor: Dr. Emily Sessa
 Project: African plant evolution and diversification
- 2014 – 2020 Graduate Researcher — Florida Museum of Natural History / U. of Florida
- 2009 – 2014 Conservation Technician — Huntington Botanical Gardens

PUBLICATIONS

*denotes equal contribution

6. CM Tribble*, J Martínez-Gómez*, **CC Howard***, J Males, V Sosa, EB Sessa, N Cellinese, CD Specht. Get the shovel: evolutionary complexities of belowground organs in geophytes. *American Journal of Botany* 108 (3): 372 – 365. doi.org/10.1002/ajb2.1623
5. **Howard CC***, CM Tribble*, J Martínez-Gómez*, EB Sessa, CD Specht, N Cellinese. 1, 2, 3, GO! Venture beyond gene ontologies in plant evolutionary research. *American Journal of Botany* 108 (3): 361 – 365. doi.org/10.1002/ajb2.1622
4. Emberts Z, CM St. Mary, **CC Howard**, M Forthman, PW Bateman, U Somjee, WS Hwang, D Li, RT Kimball, CW Miller. 2020. The evolution of autotomy in leaf-footed bugs. *Evolution* 74 (5): 897 – 910. doi.org/10.1111/evo.13948
3. **Howard CC**, N Cellinese. 2020. Tunicate bulb size in monocots explained by temperature and phenology. *Ecology and Evolution* 10 (5): 2299 – 2309. doi.org/10.1002/ece3.5996
 ▪ This research was featured on the [Florida Museum blog](#) and in the [American Gardener](#).
2. **Howard CC**, JB Landis, JM Beaulieu, N Cellinese. 2020. Geophytism in monocots leads to higher rates of diversification. *New Phytologist* 225 (2): 1023 – 1032. doi.org/10.1111/nph.16155
1. **Howard CC**, R Folk, JM Beaulieu, N Cellinese. 2019. The monocotyledonous underground: global climatic and phylogenetic patterns of geophyte diversity. *American Journal of Botany* 106 (6): 580-863. doi.org/10.1002/ajb2.1289

In review

Howard CC, AA Crawl, TS Harvey, N Cellinese. Peeling back the layers: first phylogenomic insights of the Ledebouriinae (Scilloideae, Asparagaceae). Preprint:
doi.org/10.1101/2020.11.02.365718

Zona S, **CC Howard**. Aerial vegetative diaspores of Angiosperms: terminology, organography, and dispersal.

In prep

Howard CC, L Nanyeni, N Mollel, D Chuba, AR Zuntini, WJ Baker, P Malakasi, TS Harvey, N Cellinese. Within and out of Africa: historical biogeography of the Ledebouriinae (Scilloideae, Asparagaceae).

Howard CC, P Kamau, H Vare, L Hannula, A Juslen, J Rikkinen, EB Sessa. Historical biogeography of sub-Saharan African *Asplenium* (Aspleniaceae).

Howard CC, CM Tribble, R Ferguson, EB Sessa. An integrated approach to investigating African plant diversification.

Manuscript reviewer for: *American Journal of Botany*, *New Phytologist*, *Frontiers in Plant Sciences*, *Functional Ecology*

GRANTS & AWARDS

- 2020 Honorable mention, ASPT George R. Cooley Award
UF Department of Biology Best Student Paper Award
- 2019 Botanical Society of America Bill Dahl Graduate Student Research Award (\$1500)
UF College of Liberal Arts & Sciences travel award (\$475)
Department of Biology Michael L. May Research Grant (\$300)
Biology Graduate Student Association Service Award
Society of Systematic Biologists Graduate Student Research Award (\$2000)
- 2018 John Paul Olowo Memorial Fund Research Grant (\$300)
Plant Morphology — Arnold Arboretum Short Course (travel + lodging)
- 2017 Botanical Society of America Travel Award (\$2,400)
International Botanical Congress Excellent Scholar/Outstanding Student Award (\$1,200)
- 2016 UF Research Abroad for Graduate Students Award (\$7,000)
American Society of Plant Taxonomist (\$750)
Mary Sue Ittner Bulb Research Grant (Pacific Bulb Society) (\$250)
Cactus & Succulent Society of America Research Grant (\$2,000)
University of Florida David Graduate Fellowship in Botany (\$300)
- 2015 Florida Museum of Natural History Travel Award (\$1,000)
- 2013 Mary Sue Ittner Bulb Research Grant (Pacific Bulb Society) (\$500)
- 2011 Cactus & Succulent Society of America Research Grant (\$1,500)

PRESENTATIONS

Oral presentations

- 2021 **Howard CC**, P Kamau, H Vare, L Hannula, A Juslen, J Rikkinen, EB Sessa. Historical biogeography of African *Asplenium* (Aspleniaceae). *Botany Conference*.
Howard CC, CM Tribble, EB Sessa. Plant diversification in Africa. *Botany Conference*.
[invited]
Howard CC. Ecological and evolutionary consequences of geophytism in monocots. 13th Clonal Plant Meeting [keynote speaker]

- 2020 **Howard CC**, TS Harvey, A Crawl, A Zuntini, W Baker, P Malakasi, N Cellinese. The evolutionary history of the Ledebouriinae (Scilloideae, Asparagaceae). *Botany Conference*.
- 2019 **Howard CC**, N Cellinese. The evolutionary and ecological significance of tunicate bulb size in monocots. *Botany Conference*.
Howard CC, R Folk, JM Landis, JM Beaulieu, N Cellinese. Digging for answers: the causes and consequences of geophytism in the monocots. *SICB Rising Star in Organismic Botany finalist*
- 2018 **Howard CC**, R Folk, JM Landis, JM Beaulieu, N Cellinese. Global phylogenetic patterns and diversification of monocotyledonous geophytes. *Botany Conference*.
- 2017 **Howard CC**. Bulbous Monocots: their evolution into horticultural gems. *Huntington Botanical Gardens Succulent Symposium*.
Howard CC, J Beaulieu, N Cellinese. The Monocotyledonous Underground: excavating the evolutionary history of geophytes. *International Botanical Congress (China)*.
- 2016 **Howard CC**, and N Cellinese. Buried Treasures: the wonderful underground life of bulbs. *Botany Conference*.
- 2013 **Howard CC**. LED(ebouria) Zeppelin: Why hypogeal bulbs rock! *Huntington Botanical Garden Succulent Symposium*.

Posters

- 2019 **Howard CC**, N Cellinese. Breaking ground on bulb evolution in the monocots. *Society of Integrative & Comparative Biology conference*.
- 2017 **Howard CC**, E Sessa, J Leebens-Mack, CD Specht, N Cellinese. Geophytic Organisms — Ontogeny & Phylogeny (GOOPhy). *International Botanical Congress (China)*.
- 2016 **Howard CC** and N Cellinese. Combing Africa: preliminary attempts at untangling the historical evolution of the Ledebouriinae (Scilloideae, Asparagaceae). *Evolution Conference*.
Howard CC and N Cellinese. Combing Africa: preliminary attempts at untangling the historical evolution of the Ledebouriinae (Scilloideae, Asparagaceae). *Biology at the Beach*.
- 2011 Lahmeyer S, **CC Howard**, T Harvey, A Miguel, J Folsom. Tissue Culture of Rare and Slow Growing Plants within the Desert Collections at the Huntington. *APGA Conference*.

TEACHING EXPERIENCE

Introduction to Biology 1 Lab

Teaching Assistant (4 semesters)

Biological Sciences for Non-Majors (online)

Teaching Assistant (3 semesters)

Plants in Human Affairs Lab

Teaching Assistant (3 semesters)

Biological Sciences for Non-Majors Lab

Teaching Assistant (2 semesters)

Desert Biodiversity (immersion course)

Co-instructor (2 semesters)
Evolution (online)
Teaching Assistant (1 semester)
Medical & Forensic Botany
Teaching Assistant (1 semester)

RESEARCH MENTORSHIP

Halle Marchese, University of Florida undergraduate
GOOPhy Science Writer

Pratvi Patel, University of Florida undergraduate
Ploidal level evolution within the Ledebouriinae

Kevin Truong, University of Florida undergraduate
Chromosome evolution within the Ledebouriinae

SERVICE to UNIVERSITY, SCIENTIFIC COMMUNITY, and PUBLIC

- 2021 American Society of Plant Taxonomist (ASPT) Public Relations committee
ASPT Diversity, Equity, & Inclusion liaison [two-year position]
- 2020 LGBTQ+ Social — Botany conference [co-organizer]
- 2019 Graduate Recruitment Committee — Department of Biology
Time to Dig: the importance of underground organs in plant evolution. *Botany conference*. [colloquium organizer]
Host, Biology Graduate Student Nominated Speaker — Dr. Rachel Jabaily
ASPT Public Relations committee
- 2018 President — Biology Graduate Student Association
Graduate Student Representative — Florida Museum of Natural History job search
Host, Biology Graduate Student Nominated Speaker — Dr. Chris Martine
ASPT Public Relations committee
- 2017 **Howard CC.** A Whirlwind Tour of Tanzanian Geophytes. *The Bulb Garden* 16 (2): 2017.
Fascination of Plants Day — Florida Museum of Natural History event
Vice President — Biology Graduate Student Association
Welcome Committee — Biology Graduate Student Association
- 2016 Down & Dirty: Underground plant adaptations to seasonal climates — Florida Museum of Natural History Earth Day event
Vice President — Biology Graduate Student Association
Welcome Committee — Biology Graduate Student Association
- 2015 Art of Biology, a public art & science display — Co-organizer. Hippodrome Theater Gainesville, FL.
Howard CC. *Ledebouria scabrida*: A Namibian Endemic. *The Bulb Garden* 13 (1): 2015.

- 2014 **Howard CC.** In the Shade of the Mopane: *Ledebouria* in Namibia. *Cactus & Succulent Journal* 86 (4): 2014. doi.org/10.2985/015.086.0301
- 2012 Trager JN, **CC Howard.** The Huntington Botanical Gardens Presents the 2012 Offering of International Succulent Introductions. *Cactus & Succulent Journal* 84 (2): 2012. doi.org/10.2985/0007-9367-84.2.76
- 2011 **Howard CC.** Beginners' Guide to Managing a Collection. Part 1: Keeping Track of Plants. *Cactus & Succulent Journal* 83 (3): 2011. doi.org/10.2985/0007-9367-83.3.109

PROFESSIONAL DEVELOPMENT

Passport to Great Teaching certification — UF Center for Teaching Excellence

EDITORIAL DUTIES

Cactus & Succulent Journal — Assistant Editor 2013 – present

Cactus & Succulent Society of America — Publications Committee Advisor 2020 – present

PROFESSIONAL REFERENCES

Nico Cellinese, Ph.D.

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352-273-1979; ncellinese@flmnh.ufl.edu

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352-294-2842; nadouglas@ufl.edu