



Harvard University Herbaria & Botany Libraries



Year in Review - 2020

REFLECTIONS FROM THE (INTERIM) DIRECTOR



I've just been having a bit of an out-of-body experience reading my blurb from January of last year. Rather a lot has happened in the ensuing year and a half! First and foremost, I want to thank every member of the HUH staff for your help during this challenging time for all of us. It is a testament to your dedication both to the collections and to each other that we have stayed safe and continued in our mission to share the HUH with the world. Despite the difficulties and delays inherent in working from home, digitization and curation efforts have made significant progress, particularly in terms of transcription and georeferencing, with tens of thousands of records completed. Now, we are taking the first careful steps to move back to working on campus. The whole HUH leadership team is committed to making this transition safely so, I will admit, we can taking it one step at a time with considerable caution. I hope you are all comfortable with our pace of change. Please do let me know if you have any concerns.

I will also admit that it's weird to be on campus after so long, but the change is very welcome. I think the toughest part is that so many valued members of our community retired during the last year, including Judy Warnement, Anne Marie Countie, Walter Kittredge, Julie Shapiro, Danielle Hanrahan; and two of our long-time faculty curators, Donald H. Pfister and Andrew H. Knoll. Of course, many of these friends are still around in some form – especially Don, who just last week was helping mop up a flood in the Farlow basement (some things never change) – and we hope to plan a party with them as soon as conditions allow!

To end on a happier note, I am thrilled that the FAS is allowing us to renew our tenured search in Plant and Fungal Biology, which is aimed at identifying a long term Director of the HUH. We have one last candidate to interview this fall so please keep an eye out for information about their visit and solicitation of feedback on all our candidates. I am also very happy to welcome two new HUH Fellows, Drs. Michael Bradshaw and Yujing Yan, who are joining Dr. Andrea Berardi. We all look forward to getting to know them in person – another perk of being back on campus!

In closing, thank you all for your patience and support over the last eighteen months. I am constantly impressed by our amazing staff and I know that together, we will be able to make the most of the next year.

STATEMENT OF DIVERSITY, INCLUSION, AND BELONGING

The Harvard University Herbaria (HUH) community denounces all forms of racism, harassment, and discrimination. We recognize the painful legacy of prejudice in which marginalized groups, especially scientists of color, who work across plant biology and academia have been made to feel unwelcome. With our colleagues across Harvard and in the botanical science and natural history communities, we stand ready to confront systematic racism and are committed to the creation of an inclusive and welcoming community in the HUH. We commit to the creation of a society in which all individuals are valued and in which diversity is welcomed, whether in race, gender identity, age, socioeconomic background, religion, ethnicity, ability, language, sexual orientation, or veteran status. To these ends, we are engaged in a rigorous examination of our own institutional and interpersonal practices, and are committed to the ethical stewardship of the collections we hold in trust.

We particularly want to invite all scientists to take advantage of funding opportunities that are a critical component to diversifying our community. Please join us in this important work.



STAFF NEWS

Service Anniversaries

Jeannette Everritt, 15 years

Kanchi Gandhi, 25 years

Walter Kittredge, 45 years

Retirements

Anne Marie Countie, 37 years

Danielle Hanrahan, 31 years

Julie McIntosh Shapiro, 14 years

Walter Kittredge, 45 years

Judith Warnement, 31 years

CONFERENCES & PROFESSIONAL MEETINGS

- **Danielle Castronovo** and **Diane Rielinger**, along with Ernst Mayr Library colleagues, produced a paper and presentation *Supporting Natural History Science by Connecting Collections* for the **Collect and Connect** international conference **Making Sense of Illustrated Handwritten Archives**
- **Diane Rielinger** participated in the **Biodiversity Heritage Library annual meeting** and served on a number of BHL committees
- **Library staff** attended several virtual conferences, including the **Digital Library Federation**, **Society of American Archivists (SAA)**, **Biodiversity Information Standards (TDWG)**
- **Genevieve Tocci** attended the **Integrated Pest Management Working Group** meeting
- **Hannah Merchant** attended **Eagle Hill** seminars *Introduction to Lichens* and *Marine Macroalgae: Ecology, Identification, Distribution, and Importance*
- Several staff attended the virtual **Society for the Preservation of Natural History Collections (SPNHC) Annual Meeting**; **Genevieve Tocci** presented *Curating Sporific Basidiomycetes*
- **Zachary Bailey** attended the virtual **2020 Texas Plant Conservation Conference**
- **Luis Quijada** attended several virtual courses: *Morphological Phylogenetics*, *Introduction to Phylogenomics*, and *Maps and Spatial Analysis (GIS) with R* through **Transmitting Science**
- **Jennifer Brown** presented *A Victorian Display in the 21st Century: Renovating the Glass Flowers Exhibit at Harvard University: An Illustrated Live Zoom Lecture* for **Morbid Anatomy**
- **Jennifer Brown** presented *The Glass Flowers: Marvels of Art and Science* for **Historic New England**
- **Kanchi Gandhi** attended the virtual annual Board meeting of the **Flora of North America Association**

ADMINISTRATION HIGHLIGHTS

- Implemented a new key database for better key inventory and assignment tracking
- Successfully moved all of our seminars to a virtual platform using Zoom
- Launched Staff and Specimen Spotlight series

COLLECTIONS HIGHLIGHTS

- We said farewell to retirees **Danielle Hanrahan**, **Julie McIntosh Shapiro**, and **Walter Kittredge**
- **Jennifer Brown**, **Scott Fulton**, and **Don Pfister** completed [*Glass Flowers: Marvels of Art and Science at Harvard*](#), published in May 2020
- **Jennifer Brown**, Natalja Kent, **Scott Fulton**, and **Don Pfister** provided a virtual book release and presentation for the Harvard Museum of Natural History, *From the Hands of the Makers*
- **Walton "Tinker" Green** completed rehousing the Paleobotanical Teaching Collection and started with rehousing the general Paleobotanical collection
- Staff provided a general tour for Arnold Arboretum horticulture staff
- **Michaela Schnull** participated in a Boston University Anthropology course
- **Madelynn von Baeyer** and John M. Marston published [*Best Practices for Digitizing a Wood Slide Collection: the Bailey-Wetmore Wood Collection of the Harvard University Herbaria*](#) in Quaternary International
- **Luiza Teixeira-Costa**, David C Shaw, and Simon Francis Shamoun published [*Complex interactions of mistletoe, ecosystems, and people*](#) in Botany
- **Luiza Teixeira-Costa**, Gilberto Ocampo and Gregório Ceccantini published a chapter *Morphogenesis and Evolution of Mistletoes' Haustoria* in [*Plant Ontogeny: Studies, Analyses and Evolutionary Implications*](#)

Statistics for 2020

- Welcomed 24 visitors prior to March 2020 closure
- 28 outgoing loans; 728 total specimens
- 48 returned loans; 2340 total specimens
- 4 borrows in; 198 total specimens
- 14 borrows returned; 106 specimens
- 1 exchange out; 13 specimens
- 8 exchanges in; 261 specimens
- 6 gifts out; 56 specimens
- Accessioned 12 gifts; 508 specimens
- Accessioned 2 staff collections; 18 specimens
- 227 miscellaneous requests, providing 1844 images, include 116 images from microscopy



INFORMATICS HIGHLIGHTS

- **Anne Marie Countie** retired after 37 years at Harvard
- HUH specimen records were up 75% from 2019 and downloaded over 35,000 times (up 50% for GBIF and 15% for iDigBio)
- Staff digitized over 200,000 specimens through various funded and internal projects
- Staff corrected over 20,000 specimen records through data quality projects
- Launched georeferencing efforts using the GeoLocate collaborative site (COGE)

BOTANY LIBRARY HIGHLIGHTS

- **Judy Warnement** retired (Dec. 2020) after more than 30 years as director of the Botany Libraries
- **Diane Rielinger** authored the blog post *A Forest of Knowledge: Richard Evans Schultes and the Rise of Ethnobotany* (<https://blog.biodiversitylibrary.org/2020/08/richard-evans-schultes.html>)
- The Library staff successfully transitioned to work-from-home and continued to provide services. By the end 2020, staff members were able to return to the library on a very limited basis to provide physical items.
- The Botany Libraries started crowdsourcing transcriptions of handwritten materials using the website *From the Page*. Most of the materials digitized as part of Harvard Library's Colonial North America project are transcribed and work started on Walter Deane and Asa Gray materials. Volunteers welcome! <https://fromthepage.com/harvardlibrary/harvard-botany-libraries>
- **Danielle Castronovo, Judy Warnement, Gretchen Wade** led a session of Alex Csizar's class HSCI 185: Communicating Science
- **Gretchen Wade** joined the University Library's Ask a librarian chat service, which expanded hours to help Harvard people all learning and working from off-campus
- **Gretchen Wade** served as a jurist on the Visiting Committee Prize for Undergraduate Book Collecting
- **Danielle Castronovo** became the co-chair of Harvard's ArchivesSpace Working Group
- Staff participated in several meetings, forums, and discussions providing input into the Harvard Library's new values project and multi-year strategic plan
- **Chris Robson** continues to serve on the Biodiversity Heritage Library Cataloging Group, participating in evaluating and revising metadata policies

RESEARCH FUNDING AWARDED

HUH Research Fellowship

- **Andrea Berardi**, *Floral Color Evolution in North American Silene* (to begin Feb. 2021)

Farlow Fellowship

- **Luis Quijada**, *The Farlow Legacy: A Mine of Gold to Solve Fungal Taxonomic and Systematics Problems in the Molecular Era* (July 2020)

SPONSORED RESEARCH FUNDING RECEIVED

New Awards

- none for 2020

Continuing Awards

- **Digitization TCN: Collaborative Research: Using Herbarium Data To Document Plant Niches In The High Peaks And High Plains Of The Southern Rockies - Past, Present, And Future (NSF SoRo)**
PI: Schnull
Project Dates: 9/1/2017 – 8/31/2021
Award Amount: \$404,974
- **Phenological synchrony and symbioses: assessing climate change impacts on plant-insect interactions in the Atacama Desert of Chile (CCSF Brazil)**
PI: Davis
Project Dates: 7/1/2018 – 6/30/2021
Award Amount: \$149,910
- **1000 species and counting: Harnessing the power of herbarium digitization, crowdsourcing, and phylofloristics to assess and predict phenological responses (NSF 1000 Species/CrowdCurio)**
PI: Davis
Anticipated Dates: 8/1/2018 – 8/31/2021
Total Anticipated Award: \$586,474
- **Digitization TCN: Collaborative Research: Digitizing endless forms: Facilitating Research on Imperiled Plants with Extreme Morphologies (NSF PoE/ Endless Forms)**
PI: Davis
Project Dates: 8/15/2018 – 7/31/2021
Award Amount: \$583,153
- **Digitization TCN: Collaborative: American Crossroads: Digitizing the vascular flora of the south-central United States (NSF TORCH)**
PI: Davis
Project Dates: 9/1/2019 – 8/31/2021
Award Amount: \$ 119,593

HUH FACULTY-CURATOR HIGHLIGHTS

Davis Lab News

- **Daniel Park**, Postdoctoral Fellow, accepted a position as Assistant Professor at Purdue University
- **Liming Cai**, graduate student, completed her PhD and began a postdoctoral fellowship at the University of California, Riverside
- **Adele Woodmansee**, undergraduate, was granted the Hoopes and Fay Prizes for best undergraduate thesis

Publications

- Segovia, R. A., et al. 2020. Freezing and water availability structure the evolutionary diversity of trees across the Americas. *Science Advances* 6: eaaz5373.
- Davis, C. C., et al. 2020. Climate change: be mindful at meetings. *Nature* 577, 472.
- Davis, C. C., et al. 2020. A new method for counting reproductive structures in digitized herbarium specimens using Mask R-CNN. *Frontiers in Plant Science* 11: 1129.
- Davis, C. C., et al. 2020. Andersoniella: a new genus of neotropical Malpighiaceae. *Harvard Papers in Botany* 25: 51–56.
- Davis, C. C., et al. 2020. Social media are fuelling the Amazon's destruction. *Nature* 580: 321–321.
- DeSisto, C. M. M., et al. 2020. An invasive species spread by threatened diurnal lemurs impacts rainforest structure in Madagascar. *Biological Invasions* 22: 2845–2858.
- Hedrick, B. P., et al. 2020. Digitization and the future of natural history collections. *BioScience* 70: 243–251.
- Liu, X., et al. 2020. Diverse trajectories of plastome degradation in holoparasitic *Cistanche* and genomic location of the lost plastid genes. *Journal of Experimental Botany* 71: 877–892.
- Nitta, J. H., et al. 2020. Life in the canopy: community trait assessments reveal substantial functional diversity among fern epiphytes. *New Phytologist* 227: 1885–1899.
- Park, D. S., et al. 2020. Machine learning predicts large scale declines in native plant phylogenetic diversity. *New Phytologist* 227: 1544–1556.
- Pearson, K. D., et al. 2020. Machine learning using digitized herbarium specimens to advance phenological research. *BioScience* 70: 610–620.
- Povilus, R. A., et al. 2020. Water lily (*Nymphaea thermarum*) genome reveals variable genomic signatures of ancient vascular cambium losses.

Proceedings of the National Academy of Sciences 117: 8649–8656.

- Segovia, R. A., et al. 2020. Freezing and water availability structure the evolutionary diversity of trees across the Americas. *Science Advances* 6: 5373–5379.
- Yang, Y., et al. 2020. Prickly waterlily and rigid hornwort genomes shed light on early angiosperm evolution. *Nature Plants* 6: 215–222.
- Li, H., et al. 2020. Plastome phylogenomics, systematics, and divergence time estimation of the Beilschmiedia group (Lauraceae). *Molecular Phylogenetics and Evolution* 151: 106901.
- Cai, L., et al. 2020. The perfect storm: gene tree estimation error, incomplete lineage sorting, and ancient gene flow explain the most recalcitrant ancient angiosperm clade, Malpighiales. *Systematic Biology*.
- Davis C. C., et al. 2020. Andersoniodoxa, a replacement name for Andersoniella (Malpighiaceae). *Phytotaxa* 470: 121–122.
- Davis, C. C., et al. 2020. Back to the future: a refined single user photostation for massively scaling herbarium digitization. *bioRxiv*.
- Meineke, E. K., et al. 2020. Response to Kozlov et al.: Inaccurate estimation of biases in herbarium specimen data. *bioRxiv*.
- Park, D. S., et al. 2020. Phenological displacement is uncommon among sympatric angiosperms. *bioRxiv*.

Knoll Lab News

- **Shuhai Xiao**, former graduate student, will receive the Mary Clark Thompson Medal from the National Academy of Sciences for exceptional research in paleontology and geology
- **Prof. Andrew Knoll** completed a new book, *A Brief History of Earth*, to be published in April 2021 by Harper Collins

Publications

- Del Cortona, A., et al. 2020. Neoproterozoic origin and multiple transitions to macroscopic growth in green seaweeds.. *Proceedings of the National Academy of Sciences, USA* 117: 2551–2559.
- Cantine, M., et al. 2020. Carbonates before skeletons: a database approach. *Earth Science Reviews* 201: article 103065.
- Anderson, R.P., et al. 2020. Aluminosilicate haloes preserve complex life ~800 million years ago. *Royal Society Interface Focus* 10: 20200011.

Laakso, T.A., et al. 2020. Ediacaran reorganization of the marine phosphorus cycle. *Proceedings of the National Academy of Sciences* 117: 11961–11967.

Knoll, A.H., et al. 2020. Tonian microfossils from subsurface shales in Botswana. *Precambrian Research*, doi: 10.1016/j.precamres.2020.105779.

Gomes, M., et al. 2020. Taphonomy of biosignatures in microbial mats on Little Ambergris Cay, Turks and Caicos Islands. *Frontiers in Earth Science* 8: 576712.

Pfister Lab News

- **Jason Karakehian**, Master's student at the Harvard Extension School, received a Dean's Prize for Outstanding ALM Thesis (in Biology) for his thesis entitled *A Preliminary Study in Propolis (Fungi, Ascomycota): Propolis farinosa - Common, Cosmopolitan and Plurivorous*

Publications

Brown J, Fulton SE and Pfister DH. 2020. *Glass Flowers: Marvels of Art and Science at Harvard*. Scala Arts Publishers. 144 pp.

Pfister, D.H. & Brown, J. 2020. Inspired by Plants: The Glass Flowers as a Window into Botanical Education. *Journal of Antiques & Collectibles*.

Haelewaters, D., et al. 2020. Mortality of native and invasive ladybirds co-infected by ectoparasitic and entomopathogenic fungi. *Zoological Science*.

Saba, M., et al. 2020. New species of *Pseudosperma* (Agaricales, Inocybaceae) from Pakistan revealed by morphology and multi-locus phylogenetic reconstruction. *MycKeys*, (69), pp. 1-31.

Quijada, L., et al. 2020. *Orbilia jesu-laurae* (Ascomycota, Orbiliomycetes), a new species of neotropical nematode-trapping fungus from Puerto Rico, supported by morphology and molecular phylogenetics. *Willdenowia: Annals of the Botanic Garden and Botanical Museum Berlin*, 50 (2), pp. 241-251.

Blackwell, M., et al. 2020. Laboulbeniomyces: Evolution, natural history, and Thaxter's final word. *Mycologia*, 112.

Beimforde, C., et al. 2020. *Sareomyces* cl. nov.: A new proposal for placement of the resinicolous genus *Sarea* (Ascomycota, Pezizomycotina). *Fungal Systematics and Evolution*, 6.

Haelewaters, D., et al. 2020. Draft Genome Sequence of the Globally Distributed Cockroach-Infesting Fungus *Herpomyces periplanetae* Strain D. *Haelew. 1187d*. *Microbiology Resource Announcements*, 9 (6).

Pfister, D.H., et al. 2020. *Geodina* (Pezizomycetes:

Wynneaceae) has a single widespread species in tropical America. *Fungal Systematics and Evolution*, 5 (June 2020), pp. 131-138.

Quijada, L., et al. 2020. Cones, needles and wood: *Micraspis* (Micraspidaceae, Micraspidales fam. et ord. nov.) speciation segregates by host plant tissues. *Fungal Systematics and Evolution*, 5, pp. 99-111.

Kraisitudomsook N, et al. 2020. Resurrecting the genus *Geomorium*: Systematic study of fungi in the genera *Underwoodia* and *Gymnohydnotrya* (Pezizales) with the description of three new South American species. *Persoonia*. 44:98-112.

Calle, A., et al. 2020. *Rickiella edulis*. The IUCN Red List of Threatened Species 2020: e.T172818281A172861317.