

Amigos de las Gramíneas en México

By Paul M. Peterson and Konstantin Romaschenko

Paul Peterson, Research Botanist and Curator, has been collaborating with botanists in México for more than 37 years on taxonomic, biogeographic, and evolutionary studies of the grasses. This past fall, from 15 October to 16 November 2022, Peterson and Konstantin (Kostya) Romaschenko, Research Associate, traveled to Central México to collect specimens for numerous ongoing projects principally involving Dr. Yolanda Herrera Arrieta at Instituto Politécnico Nacional, CII-DIR Unidad Durango-COFAA in Durango and Dr. Jesus Valdés Reyna at the Universidad Autónoma Agraria Antonio Narro in Saltillo.

The flora of México is extremely diverse, and the country ranks fourth in the world with more than 30,000 different species of flowering plants, compared to only 18,000 in the USA and 12,000 in all of Europe. The Poaceae or Gramineae are also diverse in México with more than 1,300 species. Peterson has traveled and collected more than 13,500 numbers in México on 28 expeditions, beginning in 1983 and 1984 with Robert F. Thorne and Carol Annable to the Sierra Juárez and Sierra de San Pedro Mártir in Baja California, and then throughout México in 1985 and 1986 to gather material of the annual species of *Muhlenbergia* in the tribe Cynodonteae for his PhD studies. If you want to work on grasses *Muhlenbergia* is a good choice be-

cause it is the most speciose genus in México with 130 species. The National Museum of Natural History's previous Curator of grasses, Thomas Soderstrom worked on the tall perennial species of *Muhlenbergia* (subg. *Trichochloa*) for his PhD studies.

Peterson and Romaschenko collected a total of 311 numbers in eight estados (states) beginning in Zacatecas (with Y. Herrera Arrieta), Durango, and Sinaloa; then heading north to Saltillo to collect in Coahuila (with J. Valdés Reyna and Jaime Flores Gaoña), Nuevo León, and

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The flora of México is extremely diverse with more than 30,000 species of flowering plants, including more than 1,300 grass species.

Poaceae

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Tamaulipas; and finally returning to Hidalgo and Querétaro in Central México. The principal objectives of this trip were to collect material in silica for DNA sequence studies to investigate the phylogeny of the tribe Stipeae, especially *Pseudoeriacoma* and *Eriocoma*, in collaboration with Valdés Reyna, and *Muhlenbergia* for revisions in Central America and México, both in collaboration with Herrera Arrieta. Even though the Stipeae are cool-season C₃ grasses and the Cynodonteae are warm-season C₄ grasses, both tribes include species that are well adapted to the xeric conditions that predominate in most habitats throughout México. Hence, Romaschenko and Peterson have ample opportunities to gather material they specialize in.

While in Nuevo León after collecting in Coahuila for three days with Valdés Reyna, the team stopped at Rancho Aguilla near Galeana to visit George Sebastian Hinton who lives and maintains a private



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Chair of Botany
Eric Schuettpelz
(schuettpelze@si.edu)

EDITORIAL STAFF

Editor
Gary Krupnick
(krupnick@si.edu)

Copy Editors
Robin Everly and Rose Gullledge

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One the cover: *Muhlenbergia* subg. *Trichochloa* near La Vuelta, Querétaro, México. (photo by Kostya Romaschenko)



Top: The inflorescence of *Pseudoeriacoma eminens* near Encantada, Coahuila, México. Bottom: A typical campsite in Durango, México, near the Sinaloa border. (photos by Kostya Romaschenko)

herbarium with specimens collected by him, his father (James or Jaime), and his grandfather (George Boole Hinton, 1882–1943). The three generations of Hinton's have contributed to the description of six new genera and 621 new species found in 13 Mexican states (see Hinton et al. 2019, <https://doi.org/10.17129/botsci.2210>). George S. began collecting on his own in 1984 and has accompanied Peterson and Romaschenko in the field numerous times. On this trip the team made a short visit to inquire about collecting in Tamaulipas. George S. telephoned a colleague who indicated it would probably be safe to be out and about during daylight hours in the western portion near the border of Nuevo León. In 1999, Peterson and Valdés Reyna described a new species endemic to Nuevo León, *Muhlenbergia jaime-hintonii*, incorrectly attributing the epithet to James rather than George S., the first collector.

Several areas of México are not safe to travel and camp, including Tamaulipas, but the team was determined to gather material of *Pseudoericoma editorum* as close to the type locality (W.F. von Karwinsky 1009c collected in La Noria del Viejo et la Miquihuana, Tamaulipas in 1841 or 1842) as possible since they detected two putative species of *P. editorum* appearing in separate clades in their molecular phylogeny.



George S. Hinton (left) and Paul Peterson in the Hinton Herbarium at Rancho Aguililla, Nuevo León, México. (photo by Kostya Romaschenko)

So, the pair made a one-day dash to Miquihuana entering Tamaulipas on a small road from the town of Doctor Arroyo in Nuevo León that was headed towards Ciudad Victoria where most of the recent terrorist activity has occurred. Once in the tiny Puebla of Miquihuana they ate lunch

at a small restaurant and struck up a conversation with some locals and inquired if they might know where Noria del Viejo (old man's well) was located. The locals suggested looking just north of the town where an old rancho once existed and perhaps in 1841 it was the only place where water could be obtained. The team then drove along the northeast perimeter of Miquihuana, and this road eventually led to a small path up a steep slope composed of calcareous rocks where they could see in the distance a monumento del Cristo (monument of Christ). They walked up the path about 600 meters and just below the monument they encountered specimens of *P. editorum* growing among the protection of Agave, *Opuntia*, and *Vachellia* (newer name for *Acacia*). This grass is highly selected for by livestock.

Having concluded their forays in northeastern México Romaschenko and Peterson headed south to Hidalgo and Querétaro. In Hidalgo they returned to Rancho Viejo where, while collecting in 2018, 2019, and 2022, the duo camped under a large avocado tree near a small farm managed by Arturo, their amigo. Above Arturo's casa along the ridge and into a cloud the group found the pastures primarily composed of European and Afri-

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Comida (lunch) of gorditas and tacos in Saltillo. L-R: Jesus Valdés Reyna, Kostya Romaschenko, and Jaime Flores Gaoña. (photo by Paul Peterson)

Poaceae

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can grasses, such as *Cenchrus clandestinus*, no doubt maintained by heavy grazing of livestock.

They returned to a *Juniperus-Quercus* woodland near La Nueva Griega, Querétaro, and camped (same location in 2016, 2018, and 2019) on land owned by Marcos Laredo, another amigo, who enthusiastically greeted them and immediately returned with tacos prepared by his wife for their cena (dinner). He had many stories to share with the group including an unusual story of his problems managing his cattle—someone had killed one of his cows with an arrow but did not remove the dead animal or any of the meat. Peterson recalls camping at this location in Querétaro three times over the past six years and having gathered at this site a diverse array of indigenous grasses. In 2022 there was only a few of these grasses left and now replaced with many introduced grasses, again indicating a loss of habitat due, in part, from intensive grazing and soil compaction from hooved animals.

Duplicates from their collections will be deposited in the CIIDIR Herbarium in Durango, and Romaschenko and Peterson will cite and include distribution and habitat information in their upcoming phylogenies and revisions of *Eriocoma*, *Muhlenbergia*, and *Pseudoeriacoma*.

This work was supported by the F. Raymond Fosberg Endowment.

Top: Kostya Romaschenko (left) and Paul Peterson pressing plants in the front yard of Jesus Valdés Reyna's casa in Saltillo, Coahuila, México. (photo by Jesus Valdés Reyna)

Bottom: Paul Peterson standing in the type locality of *Pseudoeriacoma editorum* just above Miquihuana, Tamaulipas, México. (photo by Kostya Romaschenko)



EDITOR'S NOTE

The Plant Press newsletter transitions to online-only publication

Since 1998, *The Plant Press* has been the official quarterly newsletter of the U.S. National Herbarium and the Botany Department of the National Museum of Natural History. Since its inception, the newsletter has been printed and delivered free of charge to a broad international subscription base. In 2013, a companion website was launched, making full issues of *The Plant Press* available as PDFs online, with articles from each issue also individually blogged throughout the quarter.

When the COVID-19 pandemic hit in March 2020, production of printed issues stopped, with online publication of the newsletter being the only viable option. After many months of thoughtful discussion following our return to the museum, the editor of *The Plant Press* and the Chair of the Department of Botany came to the decision to fully transition to an online-only newsletter. Printing will not resume. The January 2020 issue (Vol 23, No. 1) was the last printed issue.

Eliminating print distribution has several benefits including a reduced cost for the Smithsonian, an expedited timeline for readers to access each issue, and a lessened environmental impact saving trees and reducing waste and energy costs. Going forward, every issue will be available as a PDF for download, allowing users to print their own copy should they desire to read a hard copy of the newsletter.

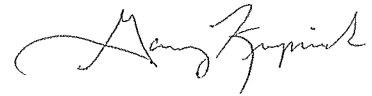
The PDF newsletter still has the same sections as the print version: News, Articles, New Faces, Staff Activities, Travel, Visitors, Honor & Awards, Publications, and Botanical Illus-

trations. Articles appearing in the PDF newsletter and the blogged articles are identical for the most part, with some online blogged articles having more imagery and hyperlinks.

To access the newsletter online, please visit *The Plant Press* at https://nrmnh.typepad.com/the_plant_press/. Downloadable PDFs of every issue are available under the "Printed Issues" tab at the top of the screen.

To receive quarterly PDF issues by email, please subscribe to *The Plant Press* listserv by sending a message to listserv@si-listserv.si.edu containing only the following in the body of the text: "SUBSCRIBE PLANTPRESS-NEWS Firstname Lastname" (replace "Firstname Lastname" with your name). Leave the subject line blank.

To have individual blog articles delivered directly to your inbox, you can now set up a subscription service for notifications. On the [website](#), in the box in the upper right, enter your email and click "subscribe". The new email service is powered by [follow.it](#), which has replaced feedburner, a former service shut down by Google in 2021. Follow.it is provided free of charge and subscribers can set email delivery settings at a frequency of their choosing.



Gary Krupnick
Editor, *The Plant Press*

U.S. National Herbarium appears on the shortlist for Apollo's Digital Innovation of the Year award

The United States National Herbarium made a surprise appearance on Apollo magazine's shortlist for their annual awards. In the "Digital Innovation of the Year" category, the herbarium was recognized for completing its seven-year project to digitize its plant collections and making the comprehensive digital data catalogue of images of specimens and transcribed labels fully accessible to the public. Working with the Smithsonian Digitization Program Office, the herbarium digitized and transcribed more than 3.8 million specimens.

Founded in 1925, Apollo is one of the world's oldest and most highly respected international magazines on the visual arts. The magazine has been recognizing major achievements in the arts for over 30 years, bestowing honors in the following cate-

gories: personality of the year, acquisition of the year, exhibition of the year, book of the year, museum opening of the year, digital innovation of the year, and artist of the year.

Sylvia Orli, the herbarium's digitization lead, commented, "We were quite tickled to be nominated for this award. We understand the value of the herbarium specimens to botanists around the world, but we did not realize that the art world was also paying attention to our efforts."

Apollo announced its shortlists for each category on November 25, 2022, with the U.S. National Herbarium joining Art-Centrica, Ars Publicata, Art UK Sculpture, Artwrld, and Factum Foundation on the shortlist for "Digital Innovation of the Year." While Art UK Sculpture was the eventual winner at an Apollo Awards cere-



The United States National Herbarium recently completed a seven-year project to digitize and transcribe more than 3.8 million botanical specimens, landing the achievement on Apollo magazine's shortlist for "Digital Innovation of the Year" award. (photo by Ingrid Lin)

mony on December 6, the U.S. National Herbarium was honored to receive such recognition.

Thoughts, impressions, and observations at the United Nations Convention on Biological Diversity Conference of the Parties (COP15), Montreal, 6-19 December 2022

By W. John Kress

The Fifteenth Conference of the Parties (COP) of the Convention on Biological Diversity (CBD) in Montreal was held on 6-19 December 2022. I spent the first week physically in Montreal as an Observer at COP representing both the Earth BioGenome Project and the DSI Scientific Network, and the second week monitoring the conference virtually. Below are my notes and impression of the proceedings.

Report on first week

These first days have been packed with plenaries, regional meetings, contact groups, friends of the co-chairs, summits, side events, focus groups, presentations, informal discussions, and outside protests. With over 1,800 participants representing 193 countries, the venue is bursting. It is clear that one thing is on everyone's mind: biodiversity. The four goals of the CBD are the conservation of biodiversity, the sustainable use of biodiversity, the equitable access and benefit sharing of biodiversity (especially genetic resources and digital sequence information), and the identification of adequate financial resources for implementation. Swirling around these four core goals are issues of climate change, protected areas, the global public good, capacity building, indigenous peoples and local communities, genetic resources, digital sequence information, business and fi-



The contact group on digital sequence information (DSI). The group met during the first week of COP15 in Montreal, Canada. (photo by W. John Kress)

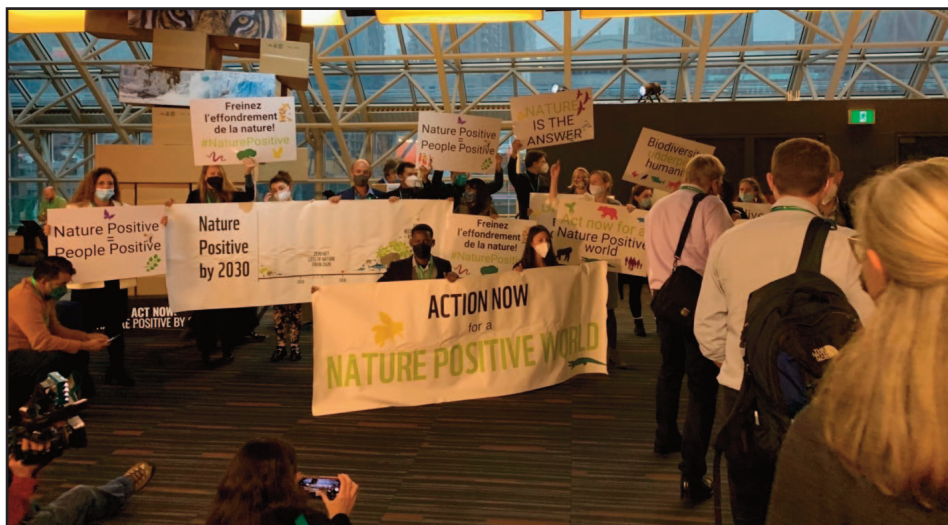
nance, and on and on. Of course, everyone has an opinion and a position on each issue.

This first week is about information sharing, staking out positions, and building allies. Those of us who are "Observers" are primarily trying to provide the necessary information for the national delegates to make informed decisions when the hardcore negotiations take place next week. All options seem to be on the table right now with regards to many of the 20+ targets under consideration.

I am here in Montreal representing "Academia and Research" as an Observer

for the Earth BioGenome Project (EBP), an international initiative aimed at generating genomic information for all species currently on Earth, about 1.8 million species. Most of my time is being spent in discussions on figuring out the best means to access genetic resources around the world, generate digital sequence information (DSI) from those samples, share the genomic data in an open and free system, and ensure that benefits (both monetary and non-monetary) flow back to the regions where those genetic resources originated. It is not clear at this point what the solution will be. From the scientific perspective, open access and multilateral regulation with free public data sharing is by far the best course of action. But many viewpoints prevail.

Three of us (Manuela da Silva, Catherine McCarthy, and myself) representing the EBP partnered with members of the DSI Scientific Network in attendance. We all arrived in Montreal early the week of December 6th, just before the official start of COP15. Deliberations by the Fifth Open Ended Working Group, which took place the week before COP began, did not advance progress on DSI. In fact things may have gone in reverse as a greater number of new proposals were advanced. The main sticking point continued to be over the implementation of bilateral vs. multilateral agreements on access to DSI and the



An expression of protest at the 15th Conference of the Parties in Montreal, Canada. (photo by W. John Kress)



Representatives of the DSI Scientific Network attend COP15. John Kress is in the center of the back row. (photo provided by the DSI Scientific Network)

mechanisms for sharing of benefits to parties involved. Just when the first week ended, a “non-paper” (i.e., a non-binding resolution) was issued that included a series of alternative proposals. These proposals ranged from taking DSI completely out of the CBD, to postponing any decision on DSI until COP16 four years in the future. Also, a number of additional views are collected, studies are conducted, and models are tested. These new data would then be considered by an Ad Hoc Open-ended Working Group and presented at a later date for consideration at COP16 in 2024. Kicking the can down the genome....

The primary model being considered at present would decouple access from benefit sharing, establish a multilateral fund to be administered by the Global Environment Facility (this is at least one option) and disperse the funds collected from a 1% levy on commercial revenue resulting from DSI (as well as voluntary contributions) as monetary benefits. The solution will “be efficient, feasible and practical; not hinder research and innovation; be consistent with open access to data; be mutually supportive of other access and benefit-sharing instruments; and take into account the rights of indigenous peoples and local communities.” In other words, many of the principles advanced by the scientific community are in the package. But it is STILL ALL UP IN THE AIR. We are now having a few days of rest before the hardcore negotiations begin. Decisions could be made by the end of this coming week. It is difficult to determine if we have made progress on DSI or not. In the long run, I remain optimistic.

During the first week, EBP and the DSI Scientific Network sponsored a number of events that reached a lot of participants and apparently had significant impact on the DSI deliberations. One was a side event on “A comparative analysis of policy options for DSI under the CBD: how do they measure up?” which was standing room only with a packed audience. Manuela da Silva from EBP was a panelist. The second addressed “Building a sustainable bioeconomy through biodiversity-based research and innovation,” which I moderated as a member of the DSI Scientific Network along with Daphne Yong d’Herve, Director for Global Policy of the International Chamber of Commerce. Four panelists spoke. This event, which was truly a meeting of academia and business, also gener-

ated a lot of interest and discussion, and was attended by a number of the national delegates involved in the negotiations. The third event was part of the Scientific Forum, which occurred between week one and week two of COP, with the topic “What capacity building for digital sequence information can offer.” This event again was well attended and put DSI in the light of local training and technology building. Ann McCartney from EBP made a presentation. We are having an impact.

Much of the official deliberations during the first week were behind closed doors which will also continue into the second week as the “High Level Consultations of the Ministers” take place. We did all that we can as scientists and researchers, and I believe it was worth the effort.

One additional issue needs to be brought up here. Of concern to many of us is the fact the United States has never actually ratified the CBD, although, it was signed by President Clinton many years ago. The Senate has yet to take action. This means that we as Americans have no seat at the negotiating table and our voices can only be heard from the outside. Besides being ineffectual, it is also embarrassing that our country has ignored this international forum. As Americans, we would best be able to have an impact on the CBD through discussion with our national representatives at COP. However, we do not have representation because our government has not ratified the treaty. Two things

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A side event on digital sequence information (DSI). During the first week of COP15, the DSI Scientific Network sponsored a number of side events that apparently had significant impact on the DSI deliberations. (photo by W. John Kress)

COP15

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that have come to my attention here in Montreal that some of us might want to consider are: 1) should we form state-wide coalitions or working groups to attend COP and have a voice at the CBD, and 2) should we as citizens concerned with conserving biodiversity begin new efforts to push for the ratification of the treaty by the US government?

These are both complex issues, but apparently not insurmountable. With regards to issue number one, there is a group of about fifty participants here at COP15 from California, representing state offices, NGOs, and private conservation groups, who have banded together with the backing of the governor to have a unified voice for their state on issues of conserving biodiversity. They are called the California Global Biodiversity Working Group, which coalesced largely due to the efforts of Rosalind Helfand, an independent environmental and social policy advisor. I have been talking with them and their organization is impressive. They are the only state that has such representation. Could other states, such as my own state of Vermont, do the same? With regards to the second issue of getting the US to ratify the treaty, the more I talk with a variety of folks here, enthusiasm seems to be growing and what was at first a crazy idea seems to be picking up speed. Could we find a champion in Congress to make this happen?

Report on second week and finale

The Fifteenth Conference of the Parties (COP) of the Convention on Biological Diversity (CBD) that convened in Montreal over the last several weeks is now over. It is done. It is history. And we may have achieved a significant victory. As scientific representatives and Observers at COP15 we survived a packed convention center, unending sessions, street protests, and snowfall to see the final session gavelled to a close by Huang Runqiu, President of the COP, at 2:30 am on 19 December. The convention ended with shouts of objections from the floor over a number of issues, but it was a successful outcome for Digital Sequence Information.

The final draft document issued on 18 December 2022 in Montreal entitled "Digital sequence information on genetic resources" (CBD/COP/15/L.30) states in



The COP15 plenary session with Huang Runqiu, President of the COP. (photo by W. John Kress)

paragraph 16 that the Post-2020 Global Biodiversity Framework:

"Decides to establish, as part of the post-2020 global biodiversity framework, a multilateral mechanism for benefit-sharing from the use of digital sequence information on genetic resources, including a global fund."

This simple statement may not seem like much, but it embodies just about everything that EBP has been seeking in an outcome on DSI. This becomes clear because earlier in the same document paragraph 9 states:

"Also agrees that a solution for fair and equitable benefit-sharing on digital sequence information on genetic resources should, inter alia:

- (a) Be efficient, feasible and practical;
- (b) Generate more benefits, including both monetary and non-monetary, than costs;
- (c) Be effective;
- (d) Provide certainty and legal clarity for providers and users of digital sequence information on genetic resources;
- (e) Not hinder research and innovation;
- (f) Be consistent with open access to data;
- (g) Not be incompatible with international legal obligations;
- (h) Be mutually supportive of other access and benefit-sharing instruments;
- (i) Take into account the rights of indigenous peoples and local communities, including with respect to the traditional knowledge associated with genetic resources that they hold."

In other words, almost all of the principles that we as scientists spelled out in our original statements on DSI are included, namely open access, multilateral, associated benefits, support for research and science, practical, and mindful of rights of indigenous communities.

Although this outcome is not the final word on how the sharing of DSI will be implemented, the decision at COP15 clearly paves the way to set up a multilateral mechanism for benefit-sharing from DSI that reflects how scientists use DSI and how internationally standardized rules can be developed that both facilitate access and use of DSI with fair and equitable benefit sharing. As the meeting ended folks from the DSI Scientific Network who were in Montreal cheered, "This is a win-win."

There is still a lot of work to be done across the scientific, technical, and policy community to make this happen. To that end the CBD will establish a DSI open-ended working group over the next two years to come up with a concrete mechanism to move forward. We all must and will remain engaged. Stay tuned.





Pollinators take spotlight at the NAPPCC 2022 Conference

The 22nd Annual International Conference of the North American Pollinator Protection Campaign (NAPPCC) was held at the National Museum of Natural History (NMNH) on 18-20 October 2022. NAPPCC's mission is to encourage the health of resident and migratory pollinating animals and the plants they service in North America. Co-hosted by [Pollinator Partnership](#), the meeting brought together NAPPCC partners in-person and virtually from throughout North America and beyond.

The NAPPCC Conference included keynote speakers, member updates, research reports, and task force breakout sessions. Task Forces are cross-discipline, short-term, project-oriented groupings designed to accomplish specific tasks. Since 1997, the 170+ members of NAPPCC have made advancements for pollinators, people, and the planet.

The conference began with an award reception at the [U.S. Botanic Garden](#) on the evening of October 18. Seven [awards](#) were handed to pollinator advocates, farmer-ranchers, roadside managers, and electric power companies. By recognizing individuals and organizations that have contributed significantly to the promotion and conservation of pollinator species in Canada, the U.S., and Mexico, NAPPCC aims to encourage their activities and inspire future actions in support of pollinators.

The conference at NMNH kicked off on October 19 with presentations from six [keynote speakers](#), covering topics related to the effects of parasites, pesticides, and climate change on pollinators, farmland lessons, sustainability, and a special focus

on lepidoptera.

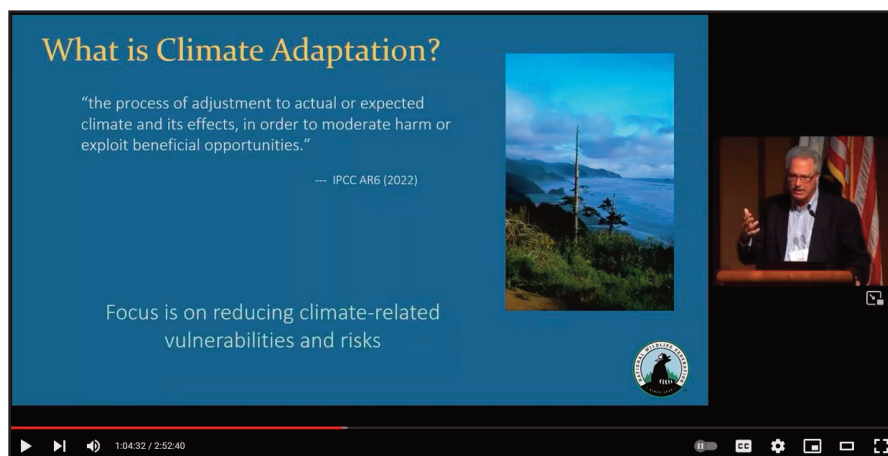
After the keynote talks, NAPPCC Task Forces presented their results from the previous year and then gathered to make plans for the coming year. The Task Forces are made up of diverse, interested parties who work to accomplish specific pollinator-related tasks. This year, the ten Task Forces are Bee Friendly Farming, Climate Change and Pollinators, Honey Bee Health, Imperiled Bombus Conservation, Lepidoptera, Pollinator Communications, Pesticide Education, Pollinator Habitat Installations, Pollinators on Managed Lands, and North American Collaboration.

An optional NMNH field trip preceded the conference on October 18. Organized by **Gary Krupnick** (Smithsonian's Department of Botany), the field trip included behind-the-scenes tours of research departments and their collections, including the Departments of [Botany](#), [Entomology](#), [Vertebrate Zoology](#) ([birds](#) and [mammals](#)), and [Paleobiology](#), as well as a guided tour

of the rare book collection of the [Joseph F. Cullman 3rd Library of Natural History](#). The 147+ million objects and specimens at NMNH are endured for future scientific research and public enjoyment. The collections have been acquired and preserved to serve the Smithsonian's mission to increase knowledge.

As the U.S. Vice Chair of the NAPPCC Steering Committee, Gary Krupnick worked with Kelly Bills and Reed Levers (Pollinator Partnership) to organize and host the conference. Krupnick also co-chairs the climate change task force, which is tasked with devising methods to educate the public on the effects of climate change on plants and pollinators and ways to mitigate these effects.

The conference attracted close to 180 people virtually and in-person combined. All keynote speaker presentations and the opening remarks were recorded and are available for viewing on the [NAPPCC website](#) and on [YouTube](#).



Video still from the keynote presentations: Bruce Stein speaks on “Pollinators and climate change: preparing for accelerating ecological transformations.”

Progress in taxonomy and evolution of the licorice family

-Adapted from the *Chinese Academy of Sciences*

Plants in the genus *Glycyrrhiza* (Fabaceae) are an important biological resource and one of the bulk of traditional Chinese medicinal materials. Its medicinal functions have been known in many countries in Asia, Africa, and Europe since ancient times. The medicinal licorice species of this genus contain a variety of secondary metabolites, among them glycyrrhizic acid and liquiritin, which have the effects of eliminating phlegm and relieving cough. *Glycyrrhiza* and *Glycyrrhizopsis* make up the tribe Glycyrrhizeae. At present, the classification of this tribe is controversial, which affects its application to a certain extent.

In a newly published study, researchers extracted low-copy nuclear genes from genome shallow sequencing data, built trees together with chloroplast genome and ri-

bosomal DNA, and combined morphological and specimen image recognition technologies for classification and phylogenetic research. The study found that the genus *Meristotropis* endemic to Central Asia should be merged into the genus *Glycyrrhiza*, so the genus contains 13 species; while its sister group *Glycyrrhizopsis* is endemic to the West Anatolian Plateau and only contains two species.

In the genus *Glycyrrhiza*, only species containing glycyrrhizic acid in the roots have medicinal value, and this trait originated twice in the genus independently. The medicinal taxa in Eurasia have a common ancestor, and their descendants all come from the rapid divergence events in the last one million years, which leads to serious morphological excess and the most chaotic species classification in this group. In this study, glycyrrhizic acid-containing *Glycyrrhiza aspera*, *G. uralensis*, and *G. in-*

flata were treated as variants of *G. glabra*, and several doubtful species were merged.

The research was led by Lei Duan and researcher Hong-Feng Chen from the Botany Center of the South China National Botanical Garden of the Chinese Academy of Sciences and was jointly completed by **Jun Wen** (Smithsonian's National Museum of Natural History) and researchers from China, Russia, and Turkey. The research work is supported by the National Natural Science Foundation of China and the Science and Technology Plan of Guangdong Province. Relevant research results were published online in the *Journal of Systematics and Evolution*. In addition, the relevant results of previous family-level taxonomy research and spatiotemporal evolution research were published in *PhytoKeys* and *Frontiers in Plant Science*, respectively.



Flower and fruit morphologies of three varieties of *Glycyrrhiza glabra*. Flowers (upper left) and fruits (upper right) of *Glycyrrhiza glabra* var. *glabra*; fruits of *G. glabra* var. *uralensis* (lower left); and fruits of *G. glabra* var. *inflata* (lower right). (image from *J. Syst. Evol.* doi: 10.1111/jse.12902)

A special herbarium visit by the Dugand family

By Virginia Vélez Thaxton, horticulturist with the Smithsonian Gardens

As a Smithsonian Gardens employee who loves working with plants, visiting a herbarium is always a treat. In the fall I was lucky to be part of a very special visit to the United States National Herbarium, with some special guests from afar, which I coordinated with **Gary Krupnick** (National Museum of Natural History).

The guest were representatives of three generations of descendants of Armando Dugand, a Colombian botanist, who collected almost 3,000 specimens from the late 1930s to the 1960s. The specimens are housed at the US National Herbarium and the guest also happen to be my relatives!

The short and emotional visit took place on the morning of October 13. During a visit to Washington DC, my cousin Beatriz Dugand, Armando's granddaughter, her son Orlando Visbal, and her grandson David Visbal, got the opportunity to see in person some of the plants collected and described by their relative years ago.

The botanist Armando Dugand Gnecco (1906-1971) was an important scientist in his native Colombia during the 20th century. From 1940 to 1953, he



From left to right: Armando Dugand, Alexander Wetmore, and Carlos Lehmann V. in the hills north of Bogota, Colombia, on March 12, 1941. Wetmore, the sixth Secretary of the Smithsonian Institution, traveled to Colombia in 1941 to collect bird specimens for the US National Museum and visited Dugand. (photo from the Smithsonian Institution Archives)

was director of the Institute of Natural Sciences of the National University of Colombia, and in 1940 he co-founded the scientific journal *Caldasia*. He was a member of the American Society of Plant Taxonomists (ASPT) and the International Association for Plant Taxonomy (IAPT). He is author to many taxonomical names in the Colombian flora, with 242 names published according to IPNI (International Plant Names Index).

Throughout his career he maintained correspondence and scientific collaborations with several Smithsonian scientists, such as José Cuatrecasas, Ellsworth Killip, and Alexander Wetmore (sixth Secretary of the Smithsonian Institution). In 1941 Wetmore met Dugand when he visited Bogotá to enhance communication and exchange between the Smithsonian and the country of Colombia. In 1944 Killip, as associate curator in the United States National Museum's Division of Plants, spent a month working with Dugand at the Institute of Natural Sciences Herbarium in Bogotá. Later, in 1966, Dugand was invited to work on herbarium specimens at the Smithsonian's Department of Botany.

My family's recent visit had great meaning to me given my career path and my own connection to the Smithsonian. When I was growing up my family would tell me that I was following in Papachi's (as his grandchildren lovingly called him) footsteps by studying biology and horticulture. During and after the visit, I talked to my cousin Beatriz about her memories and what she had learned from her grandfather, the scientist. In her eyes, her grandfather was a multifaceted, intelligent, and self-taught man who loved plants and animals, and was passionate about the flora and fauna of his native Colombia. He dedicated so much time and love to his botany profession.

When she was little, Beatriz remembers learning a lot of things from him in the small office room at his house that was full of wall-to-wall books, and plant and animal specimens that he had collected. She remembers road trips to the outskirts of the city where he would stop the car on the



Virginia Vélez Thaxton, Orlando Visbal, Beatriz Dugand, and David Visbal display a specimen of *Heliconia hirsuta* collected in 1945 by Armando Dugand in Cundinamarca, Colombia. (photo by Gary Krupnick)

side of the road to look at and collect plants. At a young age he was teaching her plant names and how to press and dry plants in newspaper to create an herbarium, and in the process, she learned to love nature. Later, as a teenager, she visited Washington DC with him in 1966 when he was invited to conduct work at the U.S. National Herbarium. On weekends she remembers visiting the herbarium and being fascinated by the cabinets filled with thousands of plants. He would explain to her the names of the plants she was seeing, where they were from, and how they were collected. But what she remembers the most is the happiness and satisfaction on his face as she could tell he was so happy in that big room surrounded by the work he loved. When they went back to Colombia, he always talked about how special his year at the Smithsonian had been.

Beatriz had this to say about the recent visit, "Having the opportunity to visit, with my son and grandson, the herbarium at the Smithsonian this past fall was extremely special and emotional to me. I could feel my grandfather's presence and remember my past visits and his happiness in that space. We were so thankful to Gary Krupnick for his hospitality and for allowing us to see many of the pressed plants that my grandfather collected himself back in the day."

Three Botany staff members retire

Botany gathered in-person on December 15th to say thanks and farewell to three long standing members of our department. Together, Bernadette Gibbons, Stan Yankowski, and Liz Zimmer have more than 110 years in service to the Smithsonian Institution. Several former fellows and interns joined us in celebrating their impact.

Bernadette Gibbons joined the department as a Secretary in October 1994. For 28 years she was a constant presence in the front office, carrying out an ever-evolving list of administrative functions. She showed incredible dedication in helping not only staff, but also contractors and visitors in navigating the museum and departmental systems. Gibbons further served as a copyeditor for *The Plant Press* since 2011.

Stan Yankowski joined the department

in November 1972 as a Museum Specialist. He jumped right into plant anatomy and was long responsible for the oversight of the anatomy lab in the Department of Botany. He also managed our vast wood collection and was responsible for many aspects of departmental safety. Over the past 50 years, he trained and assisted a huge number of researchers with plant anatomy techniques and has left some big shoes to fill.

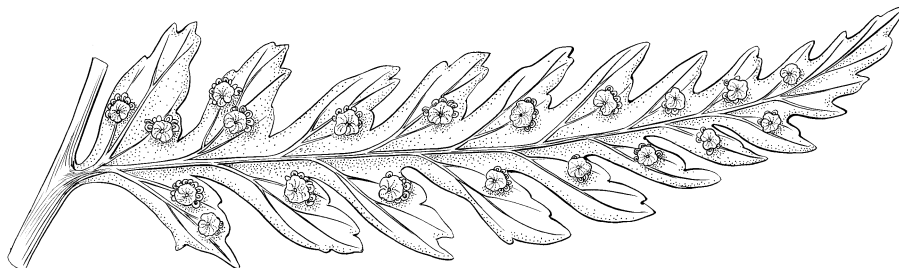
Liz Zimmer joined the Smithsonian in June 1990. She was recruited by the National Museum of Natural History to bridge the Department of Botany and the Laboratory of Molecular Systematics at the Museum Support Center, but she later transitioned to the museum. As one of the pioneers in DNA-based molecular phylogenetics, she played a critical role in bringing the department and the museum

into the molecular era. She has been honored with the Dobzhansky Prize, conferred by Society for the Study of Evolution (1982), a Radcliffe Fellowship, conferred by Harvard University (2004–2005), an NSF Visiting Fellowship for Women (1993–1995), and a Smithsonian Scholarly Studies Award (2020). She has served as the Editor-in-Chief for the journal *Molecular Phylogenetics and Evolution* since 2018. Her collaborative spirit has had an out-sized impact on students, interns, fellows, and staff over the past 32 years.

Botany is grateful to Bernadette, Stan, and Liz for their service to the department, the museum, and the greater scientific community. They are a testament to the great things that can be accomplished in working together. We wish them all the best in retirement.



At a Department of Botany retirement party on 15 December 2022, Bernadette Gibbons (left), Stan Yankowski (middle), and Liz Zimmer (right) each receiving a gift from Botany staff in appreciation and celebration of their service to the Smithsonian. (photos by Shruti Dube)



NEW FACES



My name is **Carl Johnson**, and I am the new Horticulturist over here in the weird and wonderful Botany Research Greenhouses. I moved to the DC area from eastern Connecticut. I got my first years of horticultural experience at Logee's, a rare and tropical plant nursery. It was there that I developed an appreciation for unique plant species and the nuances of taking care of them. I attended the University of Connecticut earning a bachelor's degree in Plant Science and Ornamental Horticulture. I had several on-campus jobs and extension internships. I worked in the research and student plant collections as a plant care specialist. I also interned in the plant diagnostic lab where nurseries and homeowners could send in problem plant samples for diagnosis. When the pandemic began, I started making instructional videos for house plant enthusiasts that the UConn extension would share on their YouTube page. I am coming to the Smithsonian Institution from the U.S. Botanic Garden where I worked in the Plant Collections division where I worked primarily with their aroid collection. I live in Capitol Hill Southeast with my dog Sven, a ten-year-old English Setter. My hobbies include hiking and trying out new flavors of ice cream. I am very excited to be here at the Smithsonian and to contribute to this awesome Botany Department.

VISITORS

Laura Afonso, New York Botanical Garden and University of São Paulo, Brazil; Morphology, anatomy, and systematics of Neotropical Rutaceae (10/4-10/6).

Juan Angulo, Leo-Paul Dagallier, and Fabian Michelangeli, New York Botanical Garden; Melastomataceae (10/4-10/6).

Matheus Colli Silva, University of São Paulo, Brazil; *Theobroma* and *Herrania* (Malvaceae) (10/4-10/6).

Manuela Dal Forno, Botanical Research Institute of Texas; Lichens (10/5-10/18).

Beatriz Dugand, Orlando Visbal, and David Visbal, Colombia; Armando Dugand collection (10/13).

Richard Dunn, Florida; Collections research (10/24-10/28).

Linda Geiser and Olivia Gilmer, USDA Forest Service, and **Lova Marline**, Association Vahatra—Kew Madagascar Conservation Center; Bryophytes and lichens (10/31-11/2).

Elizabeth McMurchie, Iowa State University; *Guadua* (Poaceae, Bambusoideae, Bambuseae) (10/31-11/10).

Elenice Fortes, Universidade Estadual de Campinas, Brazil, and Cornell University; Fabaceae (11/7-11/9).

Jordan Teisher, Missouri Botanical Garden; Poaceae (11/10).

Maverick Tamayo, Texas Christian University; Philippine *Vaccinium* (Ericaceae) (11/14-11/18).

Rod Wing, King Abdullah University of Science and Technology, Saudi Arabia; *Oryza* (Poaceae) (11/14).

Darin Penneys, University of North Carolina Wilmington; Melastomataceae and Actinidiaceae (12/12-12/13).

Amanda Fisher, California State University, and **Carrie Kiel**, California Botanic Garden and Claremont University; *Justicia* (Acanthaceae) (12/13-12/15).

STAFF ACTIVITIES

In September 2022, **Sylvia Orli** participated in the BioDigiCon, a recently re-branded iDigBio summit focusing on digitization and mobilization within the natural history collections. She gave a lightning talk, “A Fully Digitized Herbarium - Workflows to Keep Up 100%,” with **Ingrid Lin** (Botany) and Nathan Anderson (Smithsonian Digitization Program Office) describing the US Herbarium efforts to maintain a fully digitized status for the herbarium’s ever growing collection. In addition, in her detail capacity as Digitization Coordinator for NMNH, she participated in the workshop, “Digitization Coordination: Combining Project Management & Digitization Efforts to Benefit Collections, Big and Small,” which explored the concept of a centralized digitization program in natural history institutions. The BioDigiCon occurs annually to bring together the global natural history collections communities to discuss digitization topics.

At a request from Jennifer Brundage (Smithsonian Affiliations), **Alice Tangerini** traveled to Northfield, Vermont on November 8-10, 2022, to present a lecture and display artwork at the Sullivan Museum. The Sullivan Museum at Norwich University is the only affiliate partner in the Northeast and had a current exhibition on one of their alumni, William Brenton Boggs. Boggs was on the North Pacific Exploring and Surveying Expedition and the U.S. National Herbarium has collections from that expedition. Tangerini’s talk, “Botanical Illustration, Then and Now,” included a history of illustration in publications mentioning the changes in media used and a synopsis of collecting specimens for herbaria, preparation of herbarium specimens, and illustration techniques. She included the story of the series of cactus illustrations made for the Whipple Pacific Railroad Survey of 1854 and how they were discovered in the herbarium. She emphasized the importance of

keeping records of illustrations and how they add to our history in the sciences. The talk was well attended with an overflow in another room and recorded for later viewing. Tangerini brought full size copies of illustrations to the lecture and was able to have a small display of the Department of Botany’s Art Collection.

On December 1, 2022, **Gary Krupnick** gave an invited webinar, “A Natural History Approach to Protecting Pollinators” for the Let’s Talk Gardens webinar series hosted by Smithsonian Gardens. Pollinators are critical to environmental health, our nation’s economy, and our food security. But many pollinators are in serious decline. Krupnick’s presentation provided insight into the natural history of plant-pollinator interactions and how biologists, gardeners, and community scientists can help protect plants and their pollinators.



STAFF PICNIC



Photo by Lisa Welle Malone

Following on the success of the 2021 Botany Family Picnic, the Department of Botany held the 2022 Botany Family Picnic on 15 October at Carderock Recreation Area in Potomac, Maryland. While restrictions from the COVID-19

pandemic have largely been lifted, many members of the department continue to telework at least partially during the week. The picnic gave Botany members and their families a chance to gather and build morale. As was the case a year prior, it was

wonderful to be able to catch up, meet extended family members, laugh, and share stories of our times isolated during this unique period of our lives. And unlike the previous year, we took the opportunity to get a group photo!

TRAVEL

Pedro Acevedo and **Marcos Caraballo** traveled to the Dominican Republic (11/22 – 12/13) to conduct fieldwork and collect specimens of endemic Caribbean plants throughout the country, and to visit the herbaria at the National Botanical Garden of Santo Domingo (JBSD) and the Universidad Nacional Pedro Henríquez Ureña (HUNPHU).

Benjamin Crain traveled to Cali, Colombia (11/23 – 12/9) to meet with the orchid specialist at the Cali Zoo and to conduct orchid surveys in two areas of the Cordillera Occidental.

Stuart Davies traveled to Thailand and Singapore (11/2 – 11/20) to conduct field work in Thailand, to write a book on the ForestGEO forest dynamics plot at Khao Chong in Peninsular Thailand, to attend meetings at Kasetsart University, to attend meetings at ForestGEO plots in Thailand and Singapore, and to attend meetings with ForestGEO partners and potential supporters of the ForestGEO and STRI programs in Asia more broadly.

Paul Peterson and **Konstantyn Romashchenko** traveled throughout Central Mexico (10/16 – 11/16) to conduct fieldwork and collect grass specimens.

Alice Tangerini traveled to Tarrytown, New York (10/19 – 10/23) to attend the American Society of Botanical Artists (ASBA) 28th Annual Meeting and Conference; and to Northfield, Vermont (11/8 – 11/10) to present a lecture and display artwork at the Sullivan Museum at Norwich University.



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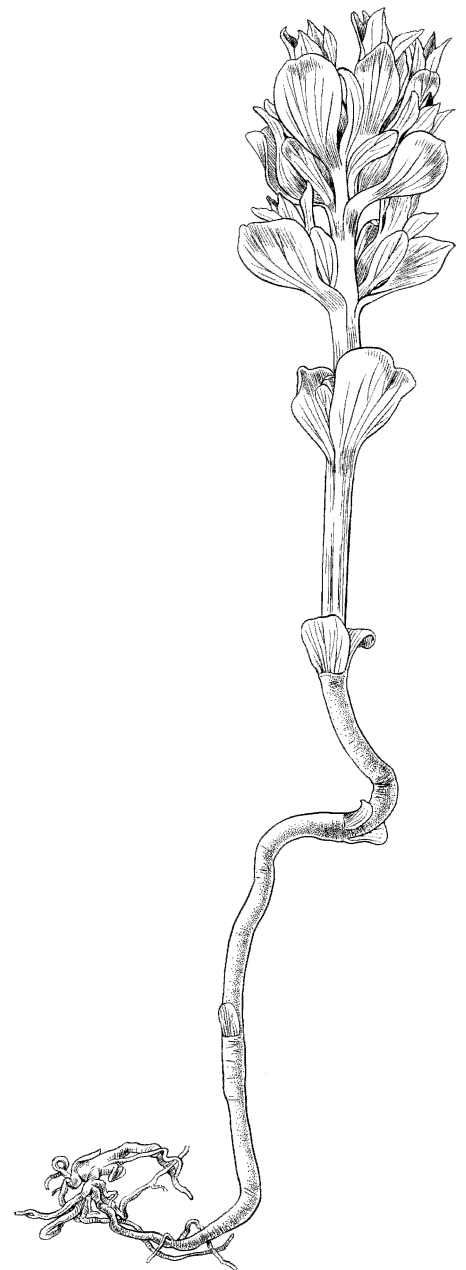
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ART BY ALICE TANGERINI

Muhlenbergia jaime-hintonii P.M.Peterson & Valdés-Reyna

When first described in 1999 from collections from southern Aramberri in southern Nuevo León, México, Paul Peterson suggested *Muhlenbergia jaime-hintonii* resided in *M.* subg. *Trichochloa*, perhaps related to *M. pubigluma* since both species share a dense white pubescence below the basal nodes, short-leafy rhizomes, reddish-gray spikelets, and faintly-3-veined lemmas. However, after producing a phylogeny based on DNA sequence markers in 2010, 2018, and 2021, *M. jaime-hintonii* was found on an isolated branch embedded within species residing in *M.* subg. *Pseudosporobolus* near other wide-ranging species from the Great Basin and Eastern North America.

Alice Tangerini inked the plate using the Gillott crowquills on drafting film. The illustration marked the initial scanning at high resolution for artwork in the department. The drawing was scanned at 1200 dpi which was twice the former scan resolution of 600 dpi. Tangerini spoke with Barney Lipscomb, *SIDA*'s editor, and requested the high resolution for the page. Lipscomb agreed to 1000 dpi which was all they could handle and the file was then reproduced in bitmap to keep the file size small. The resulting reproduction in *SIDA* (18: 686; 1999) looked very sharp and set the standard for all following illustrations.



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