

The Plant Press



Smithsonian
National Museum of Natural History

New Series - Vol. 15 - No. 1

January-March 2012

Seeking Success in Seeds

By Andrew P. Clark

The U.S. National Herbarium has been working since 2002 to process and curate the voucher collections generated as part of the Seeds of Success (SOS) program. The program is a partnership between the Bureau of Land Management (BLM) and the Royal Botanic Gardens, Kew Millennium Seed Bank (MSB). The purpose of this program is:

“to collect, conserve, and develop native plant materials for stabilizing, rehabilitating, and restoring lands in the United States, while developing a national, high quality, accurately identified, and well documented native plant species seed collection.”

The Millennium Seed Bank has an even more ambitious goal of “banking” 25 percent of the entire world’s wild plant species by 2020. This partnership between BLM and Kew was created in the shared belief that conserving plant diversity that is currently under threat from climate change and human development was a pressing concern, and that the best way to address this issue was to create a viable seed resource. This seed bank could be used to provide native seed to federal, state, and local land managers for habitat restoration and rehabilitation projects. This goal is part of a larger goal mandated by the U.S. Congress in 2001 using the Native Plant Materials Development Program to provide federal land management agencies with native plant material.

The original list of targeted species was developed by the Royal Botanic Gardens, Kew but in 2010, after the MSB

program reached its first goal of collecting 10 percent of the world’s flora, the list was expanded by BLM to include species of interest for land management projects that support restoration and rehabilitation of degraded habitats. BLM offices across the country, as well as private organizations such as the Chicago Botanic Garden, the San Diego Zoo, Lady Bird Johnson Wildflower Center, New York City Department of Parks & Recreation, Rancho Santa Ana Botanic Garden, Flagstaff Arboretum, and others are involved in the collection and identification of the species targeted by the program. In addition, the Center for Plant Conservation located at the Missouri Botanic Garden collects seed from rare, threatened, and endangered plant species, and the National Center for Genetic Resources Preservation located in Fort Collins, Colorado, is active in collecting targeted agricultural crop relatives.

With the passing of the Organic Act of 1879, Congress established that any plant collections made “for the Government of the United States, when no longer needed for investigations in progress shall be deposited in the National Museum.” This legislation amounted to a right-of-first-refusal, but was rarely invoked because, in the decades that followed this legislation, the U.S. National Herbarium has become a national focal point for collections based research in botany. As such, the Department of Botany has benefited from active collaborations with such federal agencies as the U.S. Department of Agriculture, the National Biological Survey (U.S. Geological Survey), the U.S. Forest Service, the

Environmental Protection Agency, the National Institutes of Health, and the National Park Service.

Currently the Department of Botany has received approximately 5,500 individual vouchers from the Seeds of Success program that will become part of the permanent collections of the U.S. National Herbarium. For the past four years, Core Collections Management (CCM) staff member Andrew Clark has been working closely with the SOS program to construct a protocol for the collection, pressing, labeling, and shipping of vouchers by various BLM outposts so that all collections are made in a standardized manner and arrive at the herbarium safely and well documented. BLM uses trained staff botanists, interns, and volunteers to collect vouchers and Clark has worked to impress on participants the importance of clear and concise documentation not only in regards to the physical collection but, also to the transfer of vouchers to the herbarium.

To manage this work load Clark has relied on a team of highly competent interns: Elise Cavicchi (Bennington College), Michelle Daniel (University of Toronto), ShuMing Huang (Smith College), Jean Linsky (University of Alberta), and Katherine Scussell (New College of Florida). These students, who have worked tirelessly and with great success, have helped to stabilize the condition of the SOS collection, record collection data, provide standard labels and have contacted participants for missing paperwork or labels so that it can be of most use to staff and visiting researchers

Continued on page 10

Pedro Acevedo traveled to Bronx, New York (10/25 – 10/29) to conduct research on *Paullinia* (Sapindaceae) at the New York Botanical Garden.

Laurence Dorr traveled to Leiden, The Netherlands and Kew, England (12/5–12/12) to study collections for a treatment of the Malvaceae s.l. for the *Flora of the Guianas*.

Christian Feuillet traveled to Paris, France (10/23 – 11/12) to work in the historical collections at the Museum National d'Histoire Naturelle, mainly the Adanson, Bonpland, Jussieu, and Lamarck herbaria looking for types of Boraginaceae and Passifloraceae.

Vicki Funk traveled to Davis, California (10/19 – 10/23) to attend the Compositae Genomic Working Group meeting at the University of California, Davis; to São Paulo, Brazil (12/3 – 12/10) to present several talks at the South American Compositae Meeting; and to Honolulu,

Hawaii (12/25 – 6/16) for a sabbatical at the University of Hawaii.

Carlos García-Robledo traveled to Costa Rica (11/1 – 11/30) to collect Zingiberales and Cephaloleia beetles at Braulio Carrillo National Park for a project on cascades of coextinctions under projected climate change, and to teach the Organizations for Tropical Studies graduate course, Foundations in Tropical Ecology.

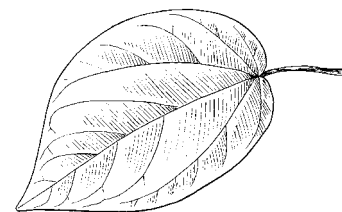
W. John Kress traveled to Bozeman, Montana (10/5 – 10/8) to receive the 2011 Edward O. Wilson Biodiversity Technology Pioneer Award; to Madison, Wisconsin (10/10 – 10/11) to meet with a donor; to Menomonie, Wisconsin (10/12 – 10/13) to meet with staff of the Menominee Tribal College; to Columbus, Ohio (10/20 – 10/21) to speak at Ohio University; and to Panama City, Panama (10/31 – 11/3) to conduct research on DNA barcodes at the Smithsonian Tropical Research Institute.

Rusty Russell traveled with **Carolyn Sheffield** to New Orleans, Louisiana (10/15 – 10/23) to present a talk and poster at the Taxonomic Database Working Group meeting.

Alice Tangerini traveled to Boston, Massachusetts (10/25 – 10/31) to participate in the American Society of Botanical Artists annual meeting.

Alain Touwaide and **Emanuela Appetiti** traveled to College Station, Texas (11/3 – 11/6) to deliver the invited keynote lecture at the annual board meeting of the Institute for Nautical Archaeology (INA) at Texas A&M University; to Chicago, Illinois (11/13 – 11/15) to present a paper at the Life and Literature conference, held at the Field Museum, and organized by the Smithsonian Institution Libraries, Biodiversity Heritage Library, and Encyclopedia of Life; and to Bronx, New York (12/13 – 12/16) to deliver an invited joint talk on “Books, Plants, and People” at the New York Botanical Gardens, where they also worked on the rare books collection.

Jun Wen traveled to Boston, Massachusetts (10/17 – 10/19) to give a seminar at Harvard University and conduct research at the Arnold Arboretum; and to Kunming, China (11/9 – 11/15) participate in a review of Kunming Institute of Botany.



The Plant Press

Reu Series - Vol. 15 - No. 1

Chair of Botany

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Visitors

Carlos García-Robledo, Smithsonian Fellow; Plant-herbivore interactions (7/20/10-7/20/12).

Vinita Gowda, Indian Institute of Science, Bangalore, India; *Alpinia* (Zingiberaceae) (11/15/10-3/31/12).

Genise Freire, Universidade Federal Rural do Rio de Janeiro, Brazil; Sapindaceae (12/1/10-12/31/11).

Quijie Li, Ynagtzte University, China; *Prunus* (Rosaceae) (12/15/10-11/30/11).

Ying Meng, Kunming Institute of Botany, China; Polygonaceae (1/9/11-8/31/12).

Xianzhou Kan, Anhui Normal University, China; Vitaceae (6/15/11-6/15/12).

Jean Linsky, University of Alberta; Plant conservation internship (9/6-12/16).

Iliana Lang, Bethesda, Maryland; Plant conservation internship (9/12/11-5/18/12).

Liu Qiuqun, Huazhong Agricultural University, China; Vitaceae (9/15/11-9/15/12).

Luciano Pataro de A. Aguiar, Universidade Estadual de Feira de Santana, Brazil; Brazilian *Microlicia* (Melastomataceae) (9/21-11/10).

Yoomi Park, Konkuk University South Korea; Pacific *Peperomia* (Piperaceae) (10/1/11-8/31/12).

Chris Campbell, University of Maine; *Amelanchier* (Rosaceae) (10/10-10/11).

Paul Flemons, Australian Museum; Digitization programs (10/12).

Amanda Treher, NatureServe; *Rhynchospora* section *Fuscae* (Cyperaceae) (10/20).

Shelley James, Bishop Museum; New Guinean collections. (10/24-10/25).

Lewis Daphne, Perry, Georgia; Bamboos (10/31-11/2).

Next Generation Sequencing Comes to NMNH

Over the last eighteen months, scientists at the Smithsonian increasingly have envisioned applying methods collectively referred to as “Next Gen Sequencing” to their research on molecular systematic and evolutionary biology. Due to continuing advances in technology fostered by the Human Genome initiative, it is now possible to sequence multiple complex genomes across the tree of life in a week or less and for as little as \$1,000, once the appropriate equipment is in place. New “genomics” collaborations with outside genome centers and new equipment on site are in the works here at the National Museum of Natural History (NMNH) and at other Smithsonian bureaus. For example, Jun Wen and I have a joint project started with Beijing Genomics Institute (BGI) in China to sequence expressed genes in members of the grape family, Vitaceae, in part to generate rapidly evolving markers applicable to biogeographic studies at and below the species level.

Adding to the excitement about “Next Gen Sequencing” is the promise of an upcoming exhibit with related educational outreach activities. The proposed 2,500-foot exhibition is the product of a partnership between the Museum and the National Institutes of Health’s National Human Genome Research Institute (NHGRI). It will open in Hall 23 on the second floor of our museum in April 2013 to celebrate the 10th anniversary of sequencing the human genome and the 60th anniversary of Watson and Crick’s discovery of the double helix structure of DNA. Displays will feature four content areas, looking at genomics from a series of broadening perspectives. Interactives, videos, and other exhibit elements that delve into the history of genomic research, future implications of genomics and compara-

tive genomics will be woven throughout the exhibit. The hope is that, after seeing the exhibit, visitors will have a new understanding of themselves and the unity of all life on the planet.

The core team developing the exhibit and related activities includes exhibit specialists from NMNH as well as research scientists and educators from both the NHGRI and the Museum. Representing researchers at NMNH are myself and Rick Potts, Director of the Human Origins Program in the Department of Anthropology.

- Liz Zimmer, Guest contributor
Research Botanist & Curator

**Chair
With
A
View
—
Warren
L.
Wagner**



Gilberto Morillo, Universidad de Los Andes, Meirda, Venezuela; Asclepiadaceae (10/31-11/26).

Andrew Henderson, New York Botanical Garden; Arecaceae (11/1-11/4).

Suzanne Nagi, University of Illinois at Urbana-Champaign; *Trientalis* (Myrsinaceae) (11/1/11-6/30/12).

Richard Travers, Royal Australasian College of Physicians, Australia; *Historia Plantarum* Collection (11/1).

Albert Zink, Institute for Mummies and the Iceman, European Academy of Bolzano/Bozen (EURAC), Italy; *Historia Plantarum* collection (11/2).

Katie Savage, Southern Cross University, Australia; *Historia Plantarum* Collection (11/7).

Janelle Burke, New York Botanical Garden; Tropical Polygonaceae, Plumbaginaceae (11/10-11/11).

Fabian Michelangeli, New York Botanical Garden; Melastomataceae (11/10-11/11).

Rubens Coelho, State University of Campinas, São Paulo, Brazil; Sapindaceae (11/14/11-11/14/12).

John Hall, Academy of Natural Sciences of Drexel University; Freshwater green algae (11/22).

Patricia Aguilera, Instituto de Botanica del Nordeste, Argentina; Compositae (11/30-12/12).

Mauro Grabiele, Universidad Nacional de Misiones, Argentina; Commelinaceae (11/30-12/12).

Leonardo Borges, Universidade de São Paulo, Brazil; *Mimosa* (Leguminosae) (12/5-12/7).

Annick Anne Regourd, Centre National de la Recherche Scientifique & Université Paris Diderot–Paris 7; History of botany and medicine in the Mediterranean (12/7).

Timothy Maniatis, National Hellenic Society, Maryland; Greek-American education (12/9).

Sandra Knapp, The Natural History Museum, London; Solanaceae (12/12-12/15).

James Reveal, Cornell University; Potamogetonaceae (12/12).

Juliana de Paula-Souza, Universidade de São Paulo, Brazil; Violaceae (12/16).

Continued on page 7

Staff Research & Activities

On 25-30 October, **Alice Tangerini** attended the American Society of Botanical Artists Conference in Boston, Massachusetts. As a member of the ASBA Board of Directors, Tangerini participated in the board meeting mainly as part of the Web Committee team. The Web Committee is designing and implementing a new website for ASBA which will make it independent of its current web server through the Hunt Institute in Pittsburgh. Tangerini will be responsible for maintaining the ASBA Members gallery and uploading members' bios and images to the new web site. In addition to the board meeting, Tangerini visited the Arnold Arboretum and the Garden in the Woods. At the Garden in the Woods, ASBA members were treated to a display of collectible illustrated botany books and a talk about their history and techniques of illustration.

On 31 October, **Alain Touwaide** and **Emanuela Appetiti** presented a lecture entitled "The Ancient Mediterranean Traditions: Old Herbs New Remedies?", at the seminar series of the Complementary and Alternative Medicine program of the medical school, Georgetown University, Washington, DC. On 10 November, Touwaide delivered a lecture at the Greek Embassy in Washington, DC, entitled "Greek Medicine in the 21st Century". On 6 December, Touwaide gave an invited presentation about the fundamental role of traditions in the evaluation process of medicines and foodstuffs at the Food and Drug Administration, in Silver Spring, Maryland.

Awards & Grants

Vicki A. Funk was a recipient of the 2011 Smithsonian Institution Secretary's Research Prize for *Systematics, Evolution, and Biogeography of Compositae* (2009; V.A. Funk, A. Susanna, T.F. Stuessy, and Randall J. Bayer, editors).

The 2011 Edward O. Wilson Biotechnology Pioneer Award, bestowed by



Edward O. Wilson (second from left) with the recipient of the 2011 Edward O. Wilson Biotechnology Pioneer Award: (from left) W. John Kress, David Jacobs, Peter Belhumeur.

the American Computer Museum, was awarded to the three Leafsnap mobile app creators: **W. John Kress**, Peter Belhumeur (Columbia University), and David Jacobs (University of Maryland). The award was presented by E.O. Wilson. The three investigators traveled to the American Computer Museum in Bozeman, Montana, to receive the award on October 6, 2011. Leafsnap, recognized as the first mobile app for plant identification, analyzes a leaf photo, instantly scans the vast collection of leaf images located in the Columbia University server and gives the user a ranked order of species matches. Currently, this free app is for the trees of the Northeastern United States but the team plans to expand the app to include all the trees of the United States. Currently available for iPhone and iPad, the Android version of the app will be available in the near future.

Ingrid Pol-Yin Lin received a 2011 National Museum of Natural History Peer Recognition Award: "The Giga Pixel Award." Yin was recognized for all the she has contributed to the Department of Botany well beyond the requirements of her contract. The speed and accuracy with which she produces high-resolution images of plant specimens enables faster responses to research inquiries, and, along

her unfailing friendliness, make Lin a wonderful representative of the Department and the Museum.



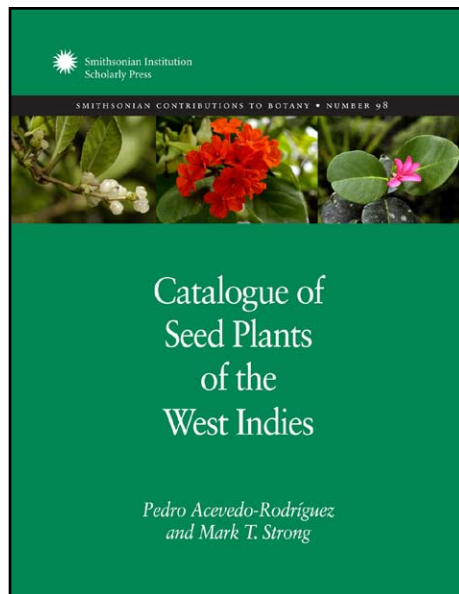
Ingrid Pol-Yin Lin (Photo by Elaine Haug)

Annotated Checklist of Scientific and Common Names of Seed Plants of the West Indies Gets Published

The *Catalogue of Seed Plants of the West Indies* compiled and edited by **Pedro Acevedo** and **Mark T. Strong**, with contributions from 16 specialists, is published in *Smithsonian Contributions to Botany*, Volume 98 (i-xxv & 1-1,192 pages). The present publication represents the first modern effort to account for the names (scientific and vernacular) of seed plants that have been reported from the Bahamas Archipelago, the Greater Antilles, and the Lesser Antilles.

More than 30,000 scientific names are treated, of which 12,279 are accepted as correct, which includes exotic and commonly cultivated plants. The total number of indigenous taxa is approximately 10,470 of which 7,446 are endemic to the archipelago or part of it, accounting for an astonishing 71 percent endemism. In addition, numerous notes on the status of rare and endangered species are provided in this publication.

Fifteen new names, 37 new combinations and 7 lectotypification are validated in this volume. The electronic version in Portable Document Format (PDF) of this Catalogue was posted on 1 January 2012 on the Smithsonian Archival Repository website <si-pddr.si.edu/dspace/handle/10088/17551>, constituting the effective date of publication for these novelties. This date is significant because it is the starting point where manuscripts in PDF with an International Standard Serial Number (ISSN) or International Standard Book Number (ISBN) are allowed as effective publication of nomenclatural novelties. Taking advantage of the changes in the International Code of Botanical Nomenclature, this work is published in electronic format before the printed version, which is expected by the end of January 2012. The PDF is available for downloading at either <si-pddr.si.edu/dspace/handle/10088/17551> or at the Smithsonian Scholarly Press website <www.sil.si.edu/smithsoniancontributions/Botany/>.



This catalogue is accompanied by a searchable website maintained at the Smithsonian Institution <botany.si.edu/antilles/WestIndies/>. The website is continuously updated to incorporate the latest taxonomical concepts and newly described taxa. The catalogue and the website are designed to work together. The catalogue provides rough distributions outside of the West Indies for every accepted scientific name. The website allows for numerous searches by family, genus, species, common names, island, and endemism status. In addition, it contains images of numerous accepted species, and in the future will have distribution maps and citation of exsiccatae. Ultimately, type specimen information will be provided for all accepted species.

2011 Grand Challenge Awards Announced

The Smithsonian Institution's four Consortia Directors have announced the recipients of the 2011 Grand Challenges Awards. Smithsonian Grand Challenges Awards advance cross-disciplinary, integrated scholarly activities across the Institution which relate to one or more of the four Grand Challenges: *Unlocking the Mysteries of the Universe*, *Understanding and Sustaining a Biodiverse Planet*, *Valuing World Cultures*, and *Understanding the American Experience*. These awards seek to advance research, as well as to broaden access, revitalize education, strengthen collections and encourage new

ways of thinking that involve emerging technology.

Thirteen Level One and 15 Level Two awards were made. The Level One grants provide seed money to develop groups and projects around promising concepts. The Level Two grants are for larger amounts and are aimed at groups that are poised to mount major projects and prepared to secure external funding for those projects. The Bill and Melinda Gates Foundation provided support for the Grand Challenge Awards.

Within the Department of Botany, three teams received funding. Level One awards include the project:

- "Pacific Island Initiative," led by **Warren Wagner** (principal investigator, NMNH), Robert Fleischer (NZP), **Vicki Funk** (NMNH), Doug Herman (NMAI), Helen James (NMNH-VZ), Chris Meyer (NMNH-IZ).

Level Two awards include two projects:

- "Establishment of the North American Orchid Conservation Center," led by principal investigators Dennis F. Whigham (principal investigator, SERC), Barbara Faust (Smithsonian Gardens), Charles Fillah (NZP), **Gary Krupnick** (NMNH), and Holly Shimizu (U.S. Botanic Garden).
- "Building the Framework of Biodiversity Science: Next Generation Phylogenetics," led by Michael Braun (NMNH-VZ, principal investigator), **Kenneth Wurdack** (NMNH), William Weislo (STRI), Jesus Maldonado (NZP, CCEG; NMNH-VZ), Kris Helgen (NMNH-VZ), Seán Brady (NMNH-ENT), along with eight non-SI external collaborators.



The 2012 Smithsonian Botanical Symposium, 20-21 April, to Explore Comparative Biology

The Department of Botany and the United States Botanic Garden will convene the 2012 Smithsonian Botanical Symposium,

“Transforming 21st Century Comparative Biology using Evolutionary

Trees,” to be held at the National Museum of Natural History in Washington, D.C., on 20 – 21 April 2012.

Over the last 20 years great progress has been made toward assembling a phylogeny of life on Earth and our expanding knowledge of evolutionary relationships is transforming 21st century biology. This is especially true in comparative biology where phylogenetic methods and trees – usually based on molecular data which is increasingly of genomics scale – are proving effective tools to reveal new and often unexpected insights into how organisms evolve and adapt to their environments. These advances span new important questions and enable a fresh look at old questions that include: diversification, role of extinction, response to climate change, co-evolution, the influence of genetic architecture on morphological evolution, and patterns of community assembly and interaction.

The Symposium will address the question: *How do we put the knowledge of evolutionary relationships to work to better describe and understand the diversification of life on Earth?* The invited speakers will cover a wide range of organisms and topics to illuminate how molecular phylogenetics can be used to understand evolutionary and ecological processes.

In addition, the tenth José Cuatrecasas Medal in Tropical Botany will be awarded at the Symposium. This prestigious award is presented annually to an international scholar who has contributed significantly to advancing the field of tropical botany. The award is named in honor of Dr. José Cuatrecasas, a pioneering botanist who spent many years working in the Department of Botany at the Smithsonian and devoted his career to plant exploration in tropical South America.

Sponsors of the Symposium are the

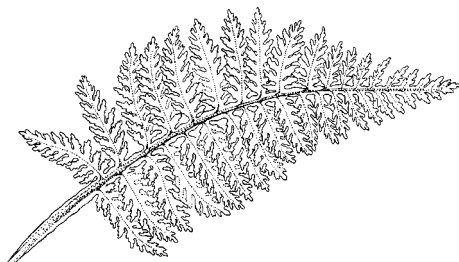
Department of Botany, the Office of the Associate Director for Research and Collections, the United States Botanic Garden, and the Cuatrecasas Family Foundation.

Registration and additional information about the

2012 Smithsonian Botanical Symposium is available at botany.si.edu/sbs/. You may also call 202-633-0920 or email sbs@si.edu for more information.

Medical Traditions Seminar

The Institute for the Preservation of Medical Traditions is offering a Medical Traditions Seminar series based on ancient Mediterranean medicine and botany aimed at Washington, D.C., area graduate students from diverse backgrounds, from botany to anthropology, including medicine, classics, history and archaeology, as well as the arts and botanical illustration. Organized by **Alain Touwaide** and **Emanuela Appetiti**, the biweekly seminar series began on 18 November, and was attended by two students from Georgetown University and two students from George Washington University. Each two-hour session aims to introduce students to medical traditions and trains them to pursue independent research on a topic. The seminar series continues through March 2012.



Antarctic Lichens on the Radar

For the past four years, a Core Collections Management (CCM) project has been responsible for processing thousands of backlog lichens, databasing thousands



Beth Stevenson (l.) and Zuvayda Abdurahimova. (Photo by Rusty Russell)

of cyanolichens, creating 853 taxon pages for the Encyclopedia of Life (EOL), and digitally imaging more than 2,800 lichen types. This work has been funded by the Smithsonian Institution Collections Care and Preservation Fund, the National Museum of Natural History Collections Program, the Drouet Fund, and internal funding from CCM. The latest activity within this project is a collaboration with the Bill Fagan lab at the University of Maryland (UMD). Beth Stevenson, a student of Paula Casanovas at UMD, is developing a digital library of Antarctic lichens for use by multiple research projects being conducted there. These projects require expertly named and well imaged lichen specimens to assist in the identification of subject material. As a result of multiple trips to Antarctica by Mason Hale, and duplicates obtained from other herbaria, the Antarctic lichen representation at the U.S. National Herbarium is quite good.

Stevenson is working with Zuvayda Abdurahimova, a contract lichenologist from Turkmenistan, to locate, database, image and re-file many thousands of Antarctic collections for more than 260 species. An image of each sheet on which the collection is maintained, as well as multiple derivative close-ups for each specimen, will be created. These data (e-records and images) will immediately become part of the EMu catalog and will be available to lichen researchers worldwide.

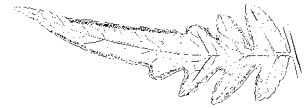
Image Response Team Jumps into Action

Back “in the day,” the only way to see a herbarium specimen in the U.S. National Herbarium was either to visit Washington, DC, or to request a loan of the specimen. In both cases the time and expense was more than negligible. With the advent of digitization, and more precisely the imaging aspect of digitization, research needs can be accommodated easily and quickly, most often from the comfort of your own office. Over the years, the Department of Botany has built an infrastructure within Core Collections Management (CCM)

that has produced 250,000 high resolution images of herbarium specimens. With a high end Phase One photo lab and two HerbScan machines, CCM is cranking out 2,000-3,000 images per month. The largest percentage of the digital images is composed of type specimens which have been online for almost a decade. The majority of the remainder is related to special research and collections initiatives.

But what happens if the image you want is not yet available? Each year CCM receives more than 100 requests for images of specimens that have not yet been digitized. Most often it is one or two, sometimes as many as 10-20. That is when the Image Response Team springs into action. **Andrew Clark, John Bog-**

gan, Elaine Haug and Ingrid Pol-Yin Lin work together to locate, inventory and image specimens upon request, many times satisfying requests in the same day. In the case of non-types, Clark locates the specimens, which often means searching multiple names and indets. If the request involves purported types, Boggan researches the status of the name and conducts a search that frequently locates the specimen in an unlikely place in the herbarium. The next step is for Haug to database each specimen and add a bar code, nimbly navigating the eccentricities of the EMu catalog. Finally the specimens move to Lin who creates a high resolution, 60MB TIF image for each. She then notifies the requestor how to obtain the images via the National Museum of Natural History’s FTP site. It is a process that has been repeated countless times and one that has received high praise from researchers around the world. And it is an excellent example of client service by the Collections and Informatics groups.



Visitors

Continued from page 3

Michael Donoghue, Peabody Museum of Natural History, Yale University; *Viburnum* (Adoxaceae) (12/16-12/19).

Heather McGettigan, Virginia Polytechnic Institute and State University; Seeds of Success program (12/19/11-1/13/12).

Nettie McMiller, The University of North Carolina at Chapel Hill; Plant conservation internship (12/19/11-1/6/12).

Matthew Smith, Virginia Polytechnic Institute and State University; Plant conservation internship (12/19/11-1/13/12).

Lauren Wyman, Princeton University; Plant conservation internship (12/19-12/23).

Frederick Foote, Epidaurus Project, Maryland; Hippocratic garden of medicinal plants (12/21).

Pia Tahvanainen-Mäenpää, Finnish Environment Institute (SYKE) & Tvärminne Zoological Station, University of Helsinki; Dinoflagellates (12/27).

Tanya Volansky, Randolph Macon College; History of Botany (12/28).



Clockwise from top left: John Boggan, Elaine Haug, Andrew Clark, Ingrid Lin. (Photo by Rusty Russell)

Recovery of Botanical Drawings Missing from the Botanical Art Collection

By Alice Tangerini

Adapted from the Field Book Project blog
nrmnh.typepad.com/fieldbooks/

On December 16, 2004, I received an email from James White, Curator of Art for the Hunt Institute for Botanical Documentation at Carnegie Mellon University, Pittsburgh, Pennsylvania, asking if I had received a query from an outfit selling two drawings by F.A. Walpole on eBay, the internet marketplace. Frederick Andrew Walpole was a staff botanical artist for the U.S. National Herbarium. Walpole was employed as an illustrator from 1896-1904, and during that time, he made many drawings on government sponsored field trips with staff botanists, notably Frederick Coville and Joseph Nelson Rose. Many of Walpole's works reside at the Hunt Institute on an indefinite loan from the Department of Botany and are catalogued there. About 10 percent of the collection is still in the Botany Department and is catalogued (with the exception of missing drawings and paintings) using information from Walpole's field notebooks.

White was scrupulous about the records of artists in the Hunt Institute and followed the activities of sales on eBay searching for art that fell within the col-



Drawing of *Pinus contorta* by F.A. Walpole

lections. White was aware that botanical illustrations were often sold on eBay, and knew from previous instances that some of these could be missing artworks from the National Herbarium collections. When he saw the Walpole drawings for sale on eBay he notified me and forwarded this message on December 16, 2004, from the consignor:

We thought you or someone you know might be interested in this eBay auction of botanical drawings by Frederick A. Walpole. Please note that this auction ends 18 Dec 2004 at 15:08:23 PST.

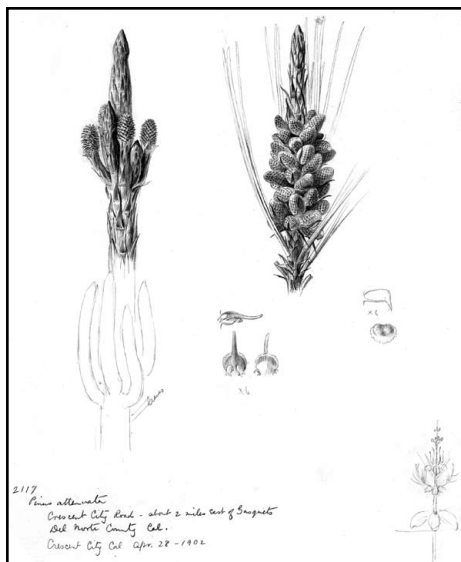
I asked **Warren Wagner** if there was a precedent for purchasing artworks with federal or trust funds. I also conferred with Smithsonian attorneys and others to determine whether we had a right to reclaim Smithsonian collections that have been lost for a number of years and are just surfacing through public sales. Unfortunately, the drawings were sold before we could determine an appropriate strategy.

On January 12, 2005, White emailed me about another auction of Walpole drawings with information on the dates for the botanical sketches included in the sales descriptions. They were posted by the same consignor as before. White tried to tie information from notes by a botanist who had researched Walpole's work to the drawings on eBay, but without having a

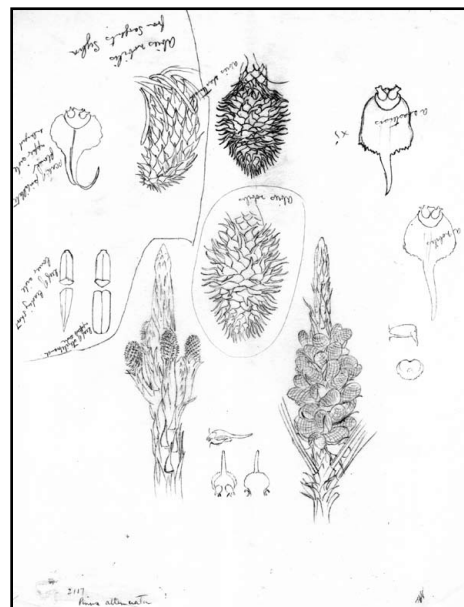
publication it was too difficult. This time, after internal consultations, we concluded that the Smithsonian might not have sufficient proof that the drawings were actually made on government time so it would be difficult to prove that they were our property. So again on January 14, 2005, the Walpole drawings were sold on eBay.

On February 14, 2005, however, another sale of two Walpole drawings with a tracing was announced by the same consignor. Specific details of dates and collection areas where the plants were drawn were included in the items' descriptions. With this information I was able to go to Walpole's field notebooks and find the individual entries for each of the drawings, which were made on official field collecting trips for the Smithsonian. There were three illustrations in graphite of two species of *Pinus* and two species of *Abies* made in 1898 and 1902. Walpole drew these in the field as studies for drawings to be executed in ink. I photocopied the item entries from Walpole's field note books and faxed these along with an emailed request to Smithsonian attorneys asking them to intervene for the Department of Botany and request return of the illustrations. The following request was sent to the consignor:

The Smithsonian has received an e-mail from you informing us of the sales of two Walpole drawings on eBay by your company. According to our records, those drawings appear to be from the national collections and were not deaccessioned,



Drawing of *Pinus attenuata* by F.A. Walpole



Drawings of *Abies nobilis*, *A. shastensis*, and *Pinus attenuata* by F.A. Walpole

sold, or otherwise transferred from our collections. Can you please provide us with information regarding the circumstances under which you acquired them? Would you be willing to withdraw them from sale while we determine whether these are, in fact, Smithsonian property?

The consignor asked for faxes of the catalog information for the drawings and when he received the faxed pages of the field notebooks he informed the Smithsonian that he would return the drawings:

We have passed on the information regarding the Walpole drawings to our client. He has asked us to send the drawings back to you.

The Walpole drawings of *Pinus* and *Abies* were returned and the consignor was thanked for his grateful return of the artwork.

Recovery of these three Walpole drawings would have been difficult or impossible without the information captured in Walpole's field notes. The documentation provided in these notes not only serves as natural science data, but in this case, served as a means to track the provenance of other materials related to the same collecting event.

Scientists, Researchers, and Government Officials Meet to Protect Pollinators

Co-hosted by the Departments of Botany, Entomology, and Education and Outreach, the 11th Annual North American Pollinator Protection Campaign (NAPPC) International Conference was held at the National Museum of Natural History on 25-27 October 2011. NAPPC is a decade-long science-based collaboration of over 140 organizations (scientists, researchers, government officials and volunteers) who are working together to protect pollinators, raise awareness of pollinator-related issues, and benefit the health of all threatened species. The conference was an active and engaging experience focusing on the protection of biodiversity, food safety and healthy wild and working land.

In addition to 12 task-force workshops attended by 120 participants, the conference included behind-the-scenes tours



Gary Krupnick giving a behind-the-scenes tour of the U.S. National Herbarium to participants of the 11th Annual NAPPC International Conference.

of the museum's collections, a public screening of *The Strange Disappearance of the Bees* followed by a Q&A with film director Mark Daniels, a public symposium featuring four keynote speakers (available for archived viewing at www.mnh.si.edu/napcc2011/), and an evening reception featuring the presentation of the NAPPC Pollinator Advocate Award and the NAPPC-NACD Farmer-Rancher Award. The meeting was organized by **Gary Krupnick** and Nate Erwin (manager of the NMNH Insect Zoo and Butterfly Pavilion).



Super Tough Seed Coat Keeps Michaux's Sumac on Critically Endangered List

Adapted from Smithsonianscience.org

It is one of the rarest shrubs in the southeastern United States but for scientists trying to save it, the critically endangered Michaux's sumac (*Rhus michauxii*) is not cooperating. So far botanists have exposed the hard-, thick-coated seeds of this native North American plant to boiling water, dry heat up to 284 degrees Fahrenheit and flames from a propane blowtorch to try to coax them

into germination. Nothing has worked. "Complete understanding of the germination requirements of endangered plants is an absolute requirement to effectively manage populations," research associate **Jay Bolin** and botanists Marcus Jones and Lytton Musselman write in a recent paper on this plant in *Native Plants Journal*. So far, however, Michaux's sumac has not given up its secrets.

Because Michaux's sumac grows only in areas with few trees where the vegetation has been disturbed, it has long been assumed that its seeds germinate naturally following exposure to the high-temperatures of a brush or forest fire. Decline of this plant has been attributed to the prevention and suppression of brush and forest fires by humans. In Virginia it grows in only two places: on the grounds of the Virginia Army National Guard Maneuver Training Center in Fort Picket and a mowed railway right-of-way in an undisclosed location.

In a recent series of germination experiments, the scientists exposed different sets of Michaux's sumac seeds to dry heat temperatures of 140, 176, 212, 248 and 284 F, some sets for 5 minutes and other sets for 10 minutes. (The temperatures were determined based on maximum wild-fire surface temperatures and burn times recorded in southeastern U.S. forests.) The researchers found that temperatures above 212 F. killed the seeds. Lower temperatures had virtually no impact on breaking the seed's dormancy.

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Michaux's Sumac

Continued from page 9

The highest germination rates—30 percent—occurred after sulfuric acid was poured on Michaux's sumac seeds and allowed to scarify (dissolve and weaken) the seed coats. This finding, from an experiment done in 1996, has led the researchers to their next experiment using birds. "We are going to feed the seeds to quail and wild turkey to determine if that breaks the seed dormancy," says Bolin, a research associate and an assistant professor at Catawba College in Salisbury, N.C. Seed passage through the digestive tracts of frugivorous (fruit eating) birds (and exposure to the acid in the bird's stomachs) may break the physical dormancy of these seeds and help disperse them as well, the scientists write.

Field Book Project Update

The Field Book Project has begun to test some digitization workflows in order to demonstrate how users can search the catalog records and obtain good quality digital images of each page. Intern Ana Tkabladze, a student from the University of Mary Washington, has spent her three week winter vacation scanning more than 45 field books, including those of Henry A. Allard whose work on photoperiodism was groundbreaking, and Cleofe Calderon who collaborated with Tom Soderstrom for many years in studying bamboo. To read more about the Field Book Project, visit www.mnh.si.edu/rc/fieldbooks/.



Ana Tkabladze creates digital images of historic field books. (Photo by Rusty Russell)



Interns Elise Cavicchi, Heather McGettigan, ShuMing Huang (left to right) mount Seeds of Success voucher specimens. (Photo by Elaine Haug)

Seeds of Success

Continued from page 1

as well as an excellent complete reference for BLM. The interns are currently in the process of databasing the entire collection so that it will be digitally available on the department's website. Each collection will also be accompanied by high quality digital images of the seeds. These images will be added to the EMu record for each collection, and will become part of the online Plant Image Collection (PIC) at botany.si.edu/plantimages.

More information about the Seeds of Success program is available at www.nps.gov/plants/sos/. The Millennium Seed Bank's webpage is www.kew.org/science-conservation/save-seed-prosper/millennium-seed-bank/.

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Art by Alice Tangerini

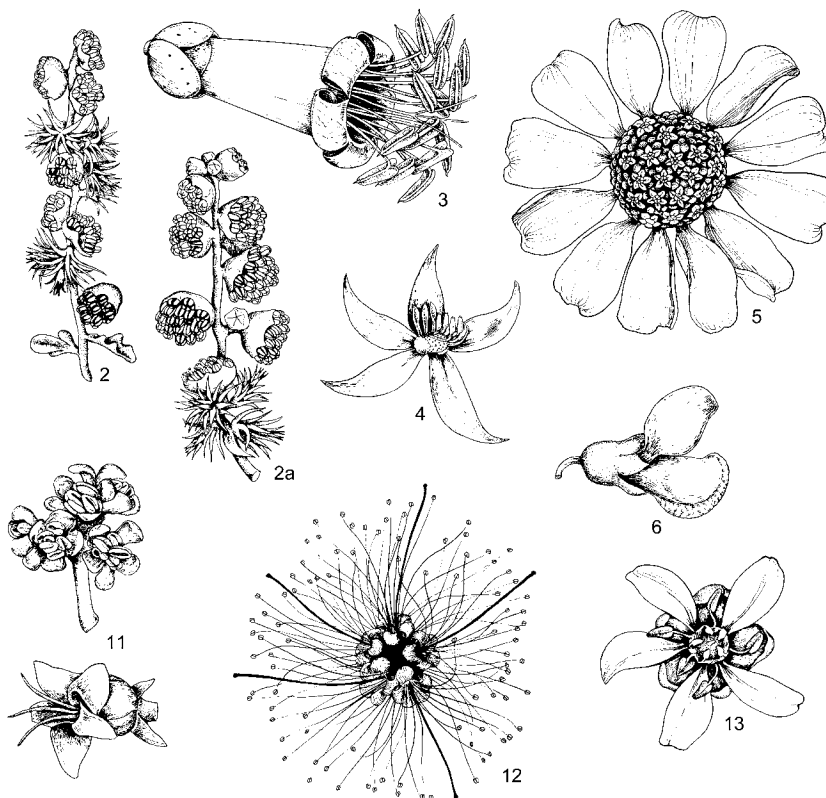
Dominant Desert Perennial Plants

The Seeds of Success program has a mission to collect, conserve, and develop native plant materials for stabilizing, rehabilitating and restoring lands in the United States.

With each collection, voucher specimens are collected to verify the species identification and are stored at the U.S. National Herbarium. Many of the desert species represented in this illustration are part of this national program.

These illustrations of flowers in the genera *Ambrosia* (2), *Fouquieria* (3), *Krameria* (4), *Encelia* (5), *Olneya* (6), *Simmondsia* (11), *Calliandra* (12), and *Larrea* (13) appeared in Beryl Simpson's 1977 publication in *Oecologia*: "Breeding systems of dominant perennial plants

of two disjunct warm desert ecosystems." The article was a study of dominant floral types in two geographic areas: the Sonoran Desert near Tucson, Arizona, and a site in Andalgalá, Cajamarca, Argentina. Simpson had supplied Tangerini with slides in addition to herbarium specimens although specific specimens were not noted in the paper or Tangerini's notes. The drawings represent the transition from working on Bristol board (used for seven species) to drafting film (nine species). (The other originals are missing). All of the individual drawings were taped on mounting board and recently had to be remounted using archival materials.



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