Department of Botany & the U.S. National Herbarium

The Plant Press

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Botany Profile

The Rebirth of the *Contributions* Series

By Susan J. Pennington

The 2004 Smithsonian Strategic Plan for Science seeks to sharpen the focus of the Institution, concentrating limited resources in those areas of research where they can be most productive. There is little doubt about the importance of the United States National Herbarium in addressing one of the core themes defined by the plan, "Discovering and Understanding Life's Diversity." Scientists have been making use of these collections for over 150 years to answer just such thorny problems. The Strategic Plan has also adopted the viewpoint of Joseph Henry, the first Secretary of the Smithsonian Institution, namely that the dissemination of research results, or "getting the message out" as it was phrased, is an equally important component of the strategic plan. Considering this mandate, it seems an appropriate time to examine the rebirth of the *Contributions from the United States National Herbarium* series and what part it can and should play in the next century of Smithsonian science.

The birth of the United States National Herbarium is traditionally dated to 1848. In that year, the botanical collections of the Wilkes expedition to the South Pacific were transferred to the young Smithsonian Institution. Lacking both the staff and the facilities to curate the specimens, the bundles of dried plants were delivered to John Torrey and Asa Gray. From the 1840s through the 1860s, the collection was housed at Columbia College under their supervision. In 1868, Torrey no longer felt able to maintain the herbarium and it was returned to Washington, D.C. While waiting for the completion of the National Museum (the Castle), the Smithsonian turned the herbarium over to the United States Department of Agriculture (USDA) under the care of its Botanist, Charles C. Parry. In April 1872, George Vasey took over the role of Botanist at the USDA. The growing herbarium was also placed in his charge. In recognition of his strides in organizing and enlarging the herbarium, the Smithsonian appointed Vasey honorary curator to its Department of Botany in 1889. He held both positions until his death in 1893, when his assistant, Frederick Vernon Coville, succeeded him.

> *"The worth and importance of the Institution are not to be estimated by what it accumulates within the walls of its building, but by what it sends forth to the world."*
>
> – Smithsonian Secretary Joseph Henry, 1852

With the exception of the grasses, the USDA formerly transferred the specimens back to the National Museum in 1894. Coville described it as "having grown beyond a mere consulting herbarium to the dimensions of a great governmental repository of botanical collections, thereby becoming a fit charge for the Smithsonian Institution" (*Botanical Gazette* 22: 418-420. 1896.)

For the next two years, the USDA continued to provide financial support for the Herbarium until July 1896, when Congress added $10,000 ($210,000 in today's dollars) to the Smithsonian's allocation. Coville remained with the USDA but, like Vasey, also served as honorary curator of the National Herbarium, which now had three full-time assistant curators. From that time to the present, the collection has continued to expand. Now, at 4.7 million specimens, it is a substantial component of the Smithsonian's Natural History collections.

From its earliest days as a repository for important collections, such as Wilkes, Wright and Palmer, the National Herbarium has inspired many seminal studies. Botanists usually chose one of three venues for these publications: scientific journals, USDA serials or Smithsonian serials. Both Gray and Torrey published descriptions of significant collections from the National Herbarium in the *Smithsonian Contributions to Knowledge* series. During his 20-year tenure as Botanist and Curator, Vasey published recent additions to and *desiderata* for the National Herbarium in the annual report of the USDA. After 1887, he

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Travel

Robert Soreng traveled to several Chinese herbaria (5/1 – 6/15) to revise *Poa* for Flora of China (FOC).

Paul Peterson and **Stephen Smith** traveled to western Canada (6/29 – 7/27) to collect grasses; Peterson traveled to Snowbird, Utah (7/29 – 8/5) to present a paper at the Botany 2004 meeting.

Dan Nicolson traveled to southern China (7/1 – 7/11) to conduct a workshop on botanical nomenclature; and to Manila, Philippines, and Taipei, Taiwan (9/15 – 10/2) to attend an officers meeting of the International Association for Plant Taxonomy, a meeting of Flora Melesiana, and to present an invited lecture.

Alice Tangerini traveled to Williamsburg, Virginia (7/4 – 7/10) to participate in the annual meeting of the Guild of Natural Science Illustrators at the College of William and Mary.

Vicki Funk traveled to Towson, Maryland (7/6) to give a seminar to the Biology Department at Towson State University; to Panama City, Panama (7/12 – 7/21) to present a talk at the Species Plantarum Programme meeting and to give a presentation at STRI; to Snowbird, Utah (7/31 – 8/7) to present two papers at the Botany 2004 conference; and to Johannesburg, South Africa (8/19 – 9/10) to collect Asteraceae in Namaqualand.

W. John Kress traveled to Costa Rica (7/8 – 7/10) to attend a meeting about DNA bar-coding at the Instituto Nacional de Biodiversidad (INBIO); to Miami, Florida (7/10 – 7/15) to attend the Association for Tropical Biology and Conservation (ATBC) annual meeting; attempted to travel to San Juan, Puerto Rico (8/1 – 8/6) to present a paper at the *Heliconia* Society International meeting; to Fulton, Maryland (9/20) to attend a meeting on Haiti habitat restoration; and to Athens, Georgia (9/29 – 9/30) to attend the dissertation defense of Jeff Lake at the University of Georgia.

Laurence Skog (Emeritus) traveled to Smithtown, New York (7/8 – 7/11) to attend the annual meeting of the American Gloxinia and Gesneriad Society; and to Snowbird, Utah (7/30 – 8/5) to attend the Botany 2004 conference.

Gary Krupnick traveled to Miami, Florida (7/10 – 7/15) to attend the Association for Tropical Biology and Conservation (ATBC) annual meeting.

Pedro Acevedo traveled to Miami, Florida (7/12) to present a paper at the Association for Tropical Biology and Conservation (ATBC) annual meeting; to Panama (7/16 – 7/17) to represent Botany at the organization meeting for Flora Neotropica held at the Smithsonian Tropical Research Institute (STRI); and to Madre de Dios, Peru (8/1 – 8/31) to conduct field research.

Maria Faust traveled to Fort Pierce, Florida (7/26 – 7/31) to collect oceanic dinoflagellates.

Warren Wagner traveled to Snowbird, Utah (7/29 – 8/5) to attend the Botany 2004 meeting; and to Los Baños, Philippines (9/20 – 9/24) to attend the 6th International Flora Malesiana Symposium.

Mike Bordelon traveled to San Juan, Puerto Rico (8/1 – 8/6) to present a paper at the *Heliconia* Society International meeting.

Mark Strong traveled to Snowbird, Utah (8/1 – 8/5) to present a paper at the Botany 2004 meetings.

James Norris and **Robert Sims** traveled to Fort Pierce, Florida (8/23 – 9/8) to conduct field work at the Smithsonian Marine Station.

Alain Touwaide traveled to Rome, Italy (8/31 – 11/8) to conduct research at the National Library on a project supported by the Earthwatch Institute; and to Bari and Metaponto, Italy (9/5 – 9/11) to deliver the inaugural lecture at the 39th conference of the International Society of the History of Medicine.

Elizabeth Zimmer traveled to Boston, Massachusetts (9/8 – 10/30) to conduct research as a Radcliffe Fellow at Harvard University.

The Plant Press

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Chair of Botany
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Visitors

Reiko Igawa, Independent researcher; Volunteer interview (7/2).

Araceli Segura-Suarez, Independent researcher; volunteer interview (7/2).

Peter Hoch, Missouri Botanical Garden; Onagraceae (7/12-7/16).

Alberto Vasquez, Independent researcher; *Epipactis* (Orchidaceae) (7/13).

Elizabeth Shores, Mississippi State University; Biography of R.M. Harper (7/14).

Joe Miller, University of Iowa; Fabaceae mimosoids (7/15-7/16).

Phillip DaSilva, Faculty of Natural Science, University of Guyana; Guyanese Mangrove conservation (7/15-7/29).

Elizabeth Zacharias, University of California, Berkeley; *Atriplex* (Chenopodiaceae) (7/16).

Jerrold Davis, Cornell University; Poaceae (7/20-7/21).

David Pivorunas, U.S. Forest Service; Consultation of plant collecting (7/20).

Ahmed Huq, National Institutes of Health - National Cancer Institute; Cambodian NCI collections (7/29-7/30).

Marina Olonova, Tomsk State University, Russia; *Poa* (Poaceae) Flora of China (8/1-10/15).

Tracey Parker, Independent researcher; Central American plants (8/3-8/13).

Steve Selva, University of Maine at Ft. Kent; Calicoid lichens, fungi from New England and maritime Canada (8/9-8/11).

Gaurav Agaarwal, University of Maryland; NSF electronic field guide project (8/16; 8/19).

Beyond Paradise: Saving Tropical Forests in the 21st Century

As we plunge into the new century the world's tropical rain forests continue their decline. The human forces responsible for the substantial degradation of tropical habitats across the globe over the last 100 years have not subsided. Since 1980 twenty-one percent of the tropical forests existing at that time have been destroyed while human populations and the rate of forest conversion to degraded habitats continue to increase in tropical countries. With the expected doubling of the population in developing countries by 2050 tropical habitats will be subjected to an unprecedented level of ecological stress. If these rates are not reduced, the latest estimates suggest that up to half of the species of plants, animals, and micro-organisms, especially in biodiversity hotspots, will be threatened with extinction by mid-century. Biologists and conservationists who have traveled and worked in numerous tropical countries on all continents have not yet found a habitat that is untouched by human activity. The state of global environmental affairs remains bleak.

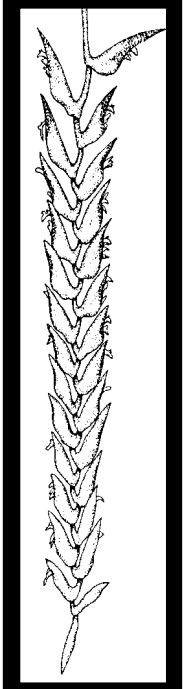
Yet at a recent meeting of tropical biologists in Miami, Florida, the outlook was not entirely pessimistic. Scientists from both developing and developed countries working in the tropics have banded together to launch a new effort to understand and conserve threatened species and natural habitats. In a newly published report entitled "Beyond Paradise: Meeting the Challenges in Tropical Biology in the 21st Century" produced by the Association for Tropical Biology and Conservation, we have reassessed our role in saving the world's terrestrial environments that lie between the tropics of Cancer and Capricorn. As scientists we no longer have the luxury of focusing myopically our efforts on pristine tropical habitats hypothetically untouched by civilization. Many tropical biologists now believe that even the most pristine tropical habitats have been influenced in some way by humans over the last thousand years. It is now clear human-impacted natural ecosystems deserve our immediate scientific attention as well. Equally imperative is the integration of social scientists with biologists, ecologists, and conservationists in the tropics. Finally, tropical science must be firmly linked with the implementation of local and national environmental policy. New perspectives on research in tropical habitats and communities must be advanced if we are to successfully conserve natural forests, savannas, and wet lands in the tropics.

Tropical scientists, following these new perspectives and principals through a lengthy process of discussion and debate, have agreed upon a set of recommendations fundamental to advancing the biological and social sciences in the tropics. These priorities are 1) to complete the inventory and classification of life in the tropics using both traditional methods and advanced information technologies, 2) to create a mega-network of scientists working in the tropics through an expanded system of field stations, 3) to strengthen research and educational institutions in the tropics to firmly root tropical biology in local countries and communities, and, finally, 4) to increase interdisciplinary interactions for information exchange among parties concerned with tropical habitats. By advancing these four recommendations, we believe that the understanding and conservation of all tropical environments will be significantly expanded.

The overwhelming impact of humans on tropical ecosystems now compels biologists, conservationists, and social scientists to act jointly for a more socially and economically relevant scientific research agenda. This undertaking by scientists from multiple countries around the globe will strive to amplify the influence of tropical researchers on environmental policy and conservation. Our common resolve to work toward this agenda will be instrumental in comprehending, conserving, restoring, and enhancing tropical forests for the perpetual benefit of nature and humanity.

Note: This essay was prepared with Thomas E. Lovejoy, President of The H. John Heinz III Center for Science, Economics and the Environment.

Chair With A View — W. John Kress



Visitors

Continued from page 2

Michael Park, University of California, Berkeley; *Eryngium* (Brassicaceae) (8/20).

Amanda Parks, East Tennessee State University Herbarium; Guianese *Morinda* (Rubiaceae) (8/23-8/27).

Sergei Andronikov, George Mason University; GIS projects (8/26).

Elizabeth Braker, Occidental College; Chilean *Puya* (Bromeliaceae) (8/26).

Allan Falconer, George Mason University; GIS projects (8/26).

Barry Haack, George Mason University; GIS projects (8/26).

Vivian Negron-Ortiz, Miami University; Caribbean Rubiaceae and Cactaceae (9/1-3/1).

J. Francisco Morales, Instituto Nacional de Biodiversidad (INBio); Neotropical Apocynaceae (9/7-9/8; 9/15).

Abena Disroe, Independent researcher; Memorial for Robert DeFilipps (9/8).

Vesna Karaman, Louisiana State University; Asteraceae (subtribe Hinterhuberinae) (9/13-9/16).

Staff Research & Activities

During the month of August, **Pedro Acevedo** conducted field work at Los Amigos Biological station in the Department Madre de Dios, Peru. The purpose of the work was to collect specimens and data on the Sapindaceae and lianas of the region. While there, Acevedo presented a talk about vines, lianas and other climbing plants.

Dan Nicolson visited southern China on 3 – 11 July. Nicolson and three other members of the Editorial Committee of the 2000 International Code of Botanical Nomenclature were invited by the South China Botanical Garden in Guangzhou and the Missouri Botanical Garden to lecture on the Code as part of the on-going English translation of the Flora of China. The three other invitees were John McNeill from Edinburgh (the current Rapporteur-Général and editor of nomenclature for *Taxon*), Fred Barrie from Chicago (the current Secretary of the General Committee), and Nick Turland (from St. Louis). Ten lectures were presented covering the entire Code. Nicolson presented two lectures: one on standard botanical references and the other on conservation and rejection of names. All lectures were simultaneously translated into Chinese during the presentation by colleagues such as Guanghua Zhu (who published a translation of the St. Louis Code into Chinese). After the lectures, the guests were treated to visits to Mt. Dinghu National Park, the headwaters of Shing Mun Reservoir, and a stay at the impressive Fairy Lake Botanical Garden at Shenzhen, which is adjacent to Hong Kong.

In August, Nicolson spent two weeks in the Philippines and Taiwan. In the Philippines, he attended council meetings of the International Association for Plant Taxonomy (IAPT) (Nicolson is Past President and Warren Wagner is Administrator of Finances). The council is preparing for elections to be held before the Vienna Congress in July 2005. Nicolson also attended a series of presentations at the 6th Flora Malesiana Symposium held at Los Baños. Finally, Nicolson spoke on the importance of the U.S. National Herbarium in neotypifying names of Philippine plants published by Blanco (1778-1845) on materials distributed by E. D. Merrill. This was Nicolson's first visit to Los Baños since 1960 where he visited for four months to begin collecting Malesian Araceae and where his first child, John, was born.

In Taipei, Taiwan, Nicolson spoke at a symposium on plant diversity, mostly composed of IAPT council members. He spoke on "Critical Botanical Works." T. C. Huang, editor of the Flora of Taiwan, was awarded the Engler Medal in Silver. Ching-I Peng was the host and arranged for Nicolson and other guests to visit several herbaria and museums in Taipei and Taichung where he annotated Araceae.

On 29 June to 27 July, **Paul Peterson, Stephen Smith,** and Jeffery M. Saarela, a Ph.D. student at the University of British Columbia, Vancouver and former Smithsonian Research Training Program intern, traveled in western Canada through Manitoba, Saskatchewan, Alberta, British Columbia, Yukon Territory, and Northwest Territories collecting grasses. Four-hundred twenty-four numbers of grasses were gathered with over half of these placed in silica for later molecular analyses. Saarela and Peterson are collaborating on a new project investigating the systematics of *Calamagrostis* in addition to their study of the molecular phylogenetics of *Bromus* and the Bromeae. The team drove along the Dempster Highway to the end of the road at Inuvik (68º 22' N), Northwest Territories, the furthest north you can travel by car in Canada. In Beaver Creek, Yukon Territory, the team visited an area selected by the White River First Nation.

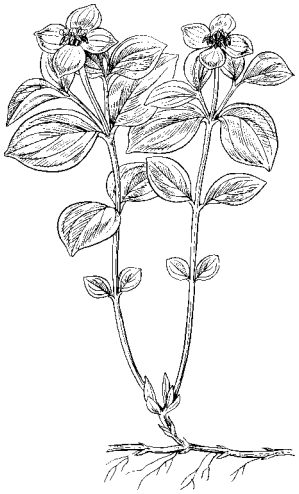
On 20 September, **Stanwyn Shetler** gave his annual lecture about local biodiversity to a class in the graduate course of Johns Hopkins University (D.C. campus) on Biodiversity and Wildlife Management. On 22 September, Shetler began a fifth season of teaching the 8-week course on Fall Woody Plant Identification in the Natural History Field Studies Program of the Graduate School of the U.S. Department of Agriculture.

From May to early July, **Robert Soreng** traveled to several Chinese herbaria to revise *Poa* for Flora of China (FOC): Beijing (PE), Nanjing (N, NAS), and Kunming (KUN, YUKU). His travel was supported by the FOC project. Co-author Marina Olonova, of Tomsk, Russia, visited PE for two months last fall, and, with support from the Walcott fund, is currently visiting the U.S. National Herbarium for 2.5 months to review collections at US and on loan from K, BM, L, the above herbaria, and MB (G. & S. Miehe vegetation surveys of the Tibetan Plateau region), and to work on the revision. In collaboration with Guang-Hua Zhu, they hope to have a revised account of the 231 taxa reported in Flora Reipubicae Popularis Sinicae (9: 91-227. 2003), completed by December 2004.

Alice Tangerini attended and participated in the Guild of Natural Science Illustrators (GNSI) national annual meeting held 4 July through 10 July, at the College of William and Mary in Williamsburg, Virginia. Tangerini and Mary Parrish, illustrator for the Department of Paleobiology, presented a joint talk on "Reconstructing Plants: Ancient and Modern," as part of a day long session on paleobiology talks organized by Parrish. Tangerini and Parrish's talks focused on techniques they used in the reconstruction process to make flattened specimens look three dimensional. In addition to lectures and digital presentations the meeting featured several workshops on digital media. Tangerini took a class on Corel Painter which was unfortunately interrupted by a severe thunderstorm and a general power outage over the campus. The instructor thought enough to have his battery powered laptop computer along and the class gathered around him to view the lesson. The situation was much like that of ancient man huddled around the campfire. Tangerini had two pieces of her work (*Anthurium ramoncaracasii* and Asteraceae achenes) in the GNSI Exhibit.

The exhibit was on display in the Virginia Living Museum in Newport News and received good reviews in the local newspaper.

Alain Touwaide has been invited to be a member of the editorial board of the new journal *African Journal of Traditional, Complementary and Alternative Medicines (AJTCAM)*.



Awards & Grants

Dan Nicolson had a new plant species named in his honor. The South American plant species *Chlorospatha nicolsonii* Croat & Hannon (*Aroideana* 27: 34. 2004) was named "for Dan Nicolson of the Smithsonian Institution, noted authority on the Araceae of Asia and first winner [in 1999] of the H. W. Schott award for excellence in Araceae research."

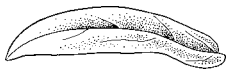
James Norris received a grant for $4,704 from the University of Louisiana at Lafayette. The title of his grant is "Monographic Research and Phylogenetic Investigations of the Ceramiales (Rhodophyla)."

Rusty Russell has received a grant from the Smithsonian Institution Latino Initiatives Program for a project entitled "Ethnobotanical Diversity in the Border Regions of U.S. and Mexico." This project will focus on the botanical collections of Edward Palmer. It will allow the Department of Botany to bring in specialists to significantly improve the locality data for these collections, bring in Mexican botanists to work on certain families, and inventory and image many of the specimens. Russell has also recently negotiated an interagency transfer of funds from USDA to continue the task of digitizing color slides for the plant image collection.

Ethnobotany of Classical Antiquity Receives Funding Support from NIH

The Department has been awarded $1,180,000 in a four-year grant (2004-2008) from the National Center for Complementary and Alternative Medicines (NCCAM) of the National Institutes of Health (NIH). **Alain Touwaide**, Research Associate since 2002, is the Principal Investigator and submitted the proposal in collaboration with Co-PI **W. John Kress**. Touwaide will lead the project, entitled "Medicinal Plants of Antiquity: A Computerized Database," which will also include Dan Moerman, an anthropologist and ethnobotanist of the University of Michigan at Dearborn and author of *Native American Ethnobotany*, and Christopher Meacham, a Research Associate of the University of California in Berkeley and the co-author of the *Synthesis* database. The project aims to recover the therapeutic uses of plants in classical antiquity (from the fifth century B.C. to the second century A.D.) for integration into contemporary research on natural medicines. The resulting comprehensive computerized database, the first on this topic, will be made available to scientists and scholars worldwide.

Research will deal with the three major ancient extant works (or groups of works) on pharmaceutical therapy and medicinal plants of classical antiquity, those by (or attributed to) Hippocrates (the fifth to fourth centuries B.C.), Dioscorides (the first century A.D.), and Galen (the second century A.D.). Texts will be read in the original Greek language; relevant data will be extracted and translated into English, and both the Greek and English versions will be stored in the primary database and indexed for retrieval. A series of secondary databases will be created to store identifications of the plants and diseases mentioned in the texts when possible, in addition to the historical data on the authors and their works. These secondary databases will be cross-linked to the primary database enabling users to have access to all of the information simultaneously for a better understanding of ancient texts.



Wagner Joins NTBG

Warren Wagner has been appointed as the McBryde Chair for Hawaiian Plant Studies at the National Tropical Botanical Garden (NTBG). "The NTBG is a remarkable place," acknowledged Chipper Wichman, Acting Director of NTBG. "It is a place that attracts some of the most gifted research scientists in our nation. Dr. Wagner is an internationally recognized leader in his field and will greatly enhance our programs. Our efforts to preserve the vanishing Hawaiian flora will certainly be strengthened by the addition of this talented individual."

Wagner occupies the McBryde Chair for Hawaiian Plant Studies for 2004-2006 while on sabbatical. The McBryde Chair, established in 1995 through an endowment, brings distinguished, senior level botanists to Garden headquarters to enhance conservation and research efforts with Hawaii's native plant species. Occupants of this post are prominent research scientists with outstanding academic and scholarly credentials; devoted teachers and mentors; and have dedicated their lives to the advancement of tropical botany and conservation.

"I am excited and honored to have been given the opportunity to occupy the McBryde Chair, especially at this time under the new leadership of Chipper Wichman," said Wagner. "The primary focus of work will be to complete, in collaboration with NTBG Senior Research Botanist David Lorence, a decade-long project on plants of the Marquesas Islands, which will be developed as an online internet resource and eventually as a two-volume book."

Wagner's first action as McBryde Chair was to develop an initiative to advance the NTBG's Conservation Program by bringing together specialists to participate in a workshop entitled "Strategic Directions for the 21st Century

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Robert A. DeFilipps (1939-2004)

Robert A. DeFilipps, 65, died of heart disease 4 July at Washington Hospital Center in Washington, D.C. DeFilipps was a museum specialist, taxonomist and conservation biologist in the Department.

DeFilipps was born on 4 March 1939, in Chicago, Illinois. He received a B.S. in 1960, from the University of Illinois at Urbana-Champaign; and an M.S. in 1962 (Master's Thesis: "A Taxonomic Study of *Juncus* in Illinois") and Ph.D. in 1968 (Doctoral Dissertation: "A Revision of *Ximenia* (Olacaceae)"), both in Botany from the Southern Illinois University at Carbondale. His research interests included the flora of the Guianas, China, Myanmar and Haiti; medicinal, ornamental and other economic plants of the Guianas, Dominica, Haiti and Myanmar; and plant conservation.

Soon after completing his doctorate, DeFilipps came to the Smithsonian Institution to collaborate with **Dan Nicolson** on the Flora of Dominica Project in the Department of Botany, National Museum of Natural History. After a year of research in Washington, D.C., he moved to England for 5 years, serving as a research associate on the Flora Europaea Project under the supervision of Professor Vernon H. Heywood at the University of Reading. In 1974, DeFilipps returned to the Smithsonian Institution, where he worked in the Department of Botany for nearly 30 years. In his position as Museum Specialist, he worked with the Endangered Flora Project (1974-1987); the Office of Biological Conservation (1978-1983); the Plant Conservation Unit (1983-1994); and the Floristics Office (1994-2003). During his final year, he again worked for the Plant Conservation Unit.

DeFilipps' most recent duties included: Editorial Assistant and Regional Advisor for Myanmar (Burma) as representative of the Smithsonian Editorial Center for the Flora of China Project; editor and database maintenance for the Revised Checklist of the Plants of Myanmar (Burma); preparation of taxonomic treatments of 46 families for Flora of the Guianas; co-editor of the *Plant Press*; and the preparation of books on medicinal (Brazil, the Guianas, Haiti, India, and Myanmar) and ornamental plants (Dominica and the Guianas). DeFilipps was also an important component of the Department's Editorial Center for the Flora of China project, sponsored by the Missouri Botanical Garden and the Institute of Botany in Beijing.

DeFilipps published 50 technical papers (including six books and 26 scientific papers) and described 14 species of flowering plants. Among his most noteworthy books is *Endangered and Threatened Plants of the United States* (Ayensu & DeFilipps, 1978), in which he played a significant role in developing the endangered plant species list for the United States. The Endangered Species Act of 1973 directed the Smithsonian to prepare a report on endangered and threatened plant species of the United States. This report was transmitted to the Congress in 1975 and published in a revised form by the Smithsonian in 1978.

Other significant publications include *Our Green and Living World: The Wisdom to Savie It* (Ayensu, Heywood, Lucas & DeFilipps, 1984); *Ornamental Garden Plants of the Guianas: An Historical Perspective of Selected Garden Plants from Guyana, Surinam and French Guiana*. (1992); *Useful Plants of the Commonwealth of Dominica, West Indies* (1998); *Medicinal Plants of India. Vol. 1* (Jain & DeFilipps, 1991); and *A Checklist of the Trees, Shrubs, Herbs, and Climbers of Myanmar* (Kress, DeFilipps, Farr & Daw Yin Yin Kyi, 2003)

During his spare time, DeFilipps' hobbies included the creation of tropical ornamental plant gardens in Dominica, Fiji, India and Haiti. At the time of his death, he was compiling a dictionary of the plants of Haiti, a work that had already reached nearly one thousand pages. He previously wrote and published a monograph on the plants of Haitian Voudou in conjunction with the famous Voudun, Hougan Max Beauvoir.

A memorial for DeFilipps was held at the U.S. National Herbarium on 8 September. Over 60 people paid their respects, while listening to eulogies from **W. John Kress**, **Gary Krupnick**, and DeFilipps' brother Willard DeFilipps. Other guests, such as Abena Disroe, goddaughter of Beauvoir, spoke about his life and extensive work, and learned about other facets of DeFilipps that go beyond

what can be found in his curriculum vitae: his quick wit, his love for tropical fish, and his ability to get lost while hiking in Dominica.

Wagner

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– Envisioning the Potential of the National Tropical Botanical Garden." Wagner assisted Wichman, together with David Burney, NTBG's Director of Conservation, in hosting this three-day conservation summit at NTBG headquarters in April of this year. The summit was attended by 18 participants representing State and Federal agencies, non-profit organizations, botanical garden directors, and research scientists. The goal of the summit was to examine the role of conservation at the NTBG and make recommendations concerning present challenges and future priorities.

The National Tropical Botanical Garden is a not-for-profit corporation, funded primarily by donations from individuals and grants from foundations and agencies. The NTBG is dedicated to protecting, conserving, and studying the world's tropical plants, with an emphasis on threatened and endangered species, and sharing the knowledge gathered with professionals, students, and the general public. NTBG's national administrative and program headquarters is located on Kauai, Hawaii. It has three gardens and one preserve on Kauai, Hawaii; a garden on Maui, Hawaii; two preserves on the Big Island of Hawaii, and a garden in southeast Florida.

Type Specimen of a "Living Fossil" Discovered

By John Boggan

A new gem—or rather, an old gem that went unrecognized for half a century—has been discovered in the U.S. National Herbarium: a type specimen of the famous "living fossil" *Metasequoia glyptostroboides*. This species, described by Chinese botanists H.H. Hu and W.C. Cheng in 1948, caused an international sensation in the 1940s when it was identified as a living representative of a genus previously known only from fossils (*Science* 107: 140. 1948; *Arnoldia* 8: 1-8. 1948).

In October 2004 the Department's Type Specimen Register received a specimen of *Metasequoia glyptostroboides* that had recently been annotated as a syntype by visiting Brooklyn Botanic Garden botanist Jinshuang Ma. The specimen, C.T. Hwa 2, collected in China on 12 September 1947, was sent to the National Herbarium from the Arnold Arboretum sometime in the 1940s. According to a note on the label by E.D. Merrill it was "doubtless collected from the original type tree," but there was otherwise no indication on the specimen that it was a type specimen. It was filed in the general herbarium, where it languished for over 50 years until discovered by Ma in 2003.

"New" types of old species regularly turn up in the general herbarium, but it seemed odd that a type specimen of such a famous species could go for so long without being recognized. Even more confusing, according to the Missouri Botanical Garden's Tropicos Web site, the type collection is C.Y. Hsueh 5, collected 20 February 1946, with the holotype deposited in the herbarium of the Arnold Arboretum. According to the Harvard University Herbaria Web site, all specimens at the Arnold Arboretum are syntypes.

Because of the discrepancy between Ma's annotation and Tropicos, it seemed worth checking the original description of the species to confirm it one way or the other. Sure enough, among several collections cited in Hu and Cheng's original description (*Bulletin of the Fan Memorial Institute of Biology* 1: 153-163. 1948), two were explicitly indicated as types: "C.J. Hsueh no. 5, type in flowers and cones without foliage shoots, Feb. 20, 1946" and "...same locality, same tree, C.T. Hwa no. 2, type in cones with foliage shoots, Sept. 12, 1947." The US collection clearly matches the second specimen cited as "type." Since two collections made by different collectors on different dates (albeit from the same tree) are indicated as "type" both have equal status as syntypes. The specimens at the Arnold Arboretum are thus isosyntypes, one of them perhaps being a lectotype at best (although it is unclear whether a lectotype has ever been designated, either explicitly or effectively).

An interesting footnote is that the original tree from which the type specimens were collected is still living and a recent photograph of the tree accompanied an article about this species in *Taxon* (52: 585-588. 2003). More information on the botanical history of this species, including an extensive bibliography, is available at Jinshuang Ma's Web site at <http://metasequoia.org>.

A Summer of Meetings

Summertime is the season when Department staff attends conferences and presents their research to the scientific community. This summer proved to be a productive one. The National Museum of Natural History was well-represented at the annual meeting of the Association for Tropical Biology and Conservation (ATBC) which convened in Miami, Florida, on 12 – 16 July. **Cristián Samper**, Director of NMNH, opened the scientific program with the plenary address, "Forests in the Clouds: Ecology and Conservation of Andean Ecosystems." **W. John Kress**, Botany Chair and Executive Director of ATBC, presented the inauguration of the report, "Beyond Paradise: Meeting the Challenges in Tropical Biology in the 21st Century." This new white paper defines research and funding priorities in tropical biology and serves as an update of the 1980 report "Research Priorities in Tropical Biology." The current initiative is the result of an international effort begun in 2000 to review the state of tropical biology and to explore opportunities for future advances in the field. "Beyond Paradise" provides guidelines that encourage tropical biologists and funding organizations to move beyond the current vision of protecting undisturbed lands to a perspective that integrates social realities. The report is available at <http://www.atbio.org> or by contacting the Department. **Pedro Acevedo-Rodríguez** presented his paper "Status of Floristic Inventory in the Caribbean," in a symposium that explored Caribbean plant diversity and evolution. **Gary Krupnick**, representing the Plant Conservation Unit, also attended the meeting.

On 29 July to 5 August, many staff botanists converged on Snowbird, Utah, for the Botany 2004 meeting. **Vicki Funk** was quite visible presenting two papers, "Using a Supertree to Understand the Diversity and Distribution of the Compositae" (Funk, V, Bayer, R.J., Keeley, S., Chan, R., Watson, L., Gemeinholzer, B., Schilling, E., Panero, J., Baldwin, B.G., Garcia-Jacas, N., Susanna, A., and Jansen, R.K.) and "The Importance of Outgroup Selection and the Use of Unrooted Networks in Determining the Phylogeny of the Tribe Arctoteae (Compositae: Subfamily Cichorioideae *sensu stricto*) Using trnL-F, ndhF, and ITS (Funk, V. and R. Chan), and a poster "Using GIS to Apply Museum Collections Data to Biodiversity Studies and Conservation in Guyana" (Hollowell, T., V. A. Funk, K.

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Summer

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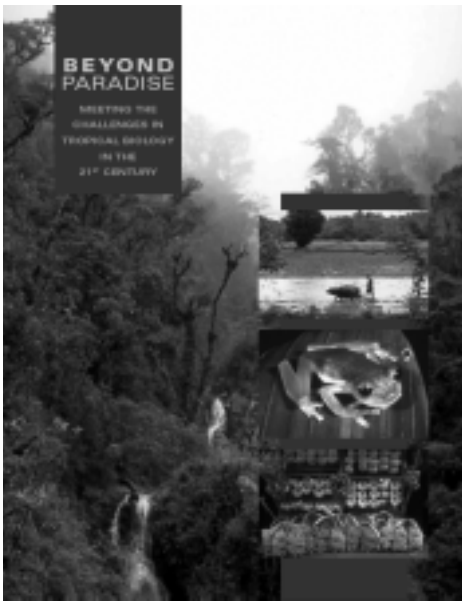
Richardson, and S. Ferrier). **Carol Kelloff** presented "Phytogeography of Kaieteur Falls, Potaro Plateau, Guyana: Floral Distributions and Affinities" (Kelloff, C. L. and V. Funk). **Paul Peterson** presented his paper "A Phylogeny of the Muhlenbergiinae (Poaceae: Chloridoideae: Cynodonteae) Based on ITS and trnL-F Sequences" (Peterson, P.M., J.T. Columbus, N.F. Refulio Rodriguez, R. Cerros Tlatilpa, and M.S. Kinney). **Mark Strong** gave the talk "Micromorphological Achene Features of *Rhynchospora* (Cyperaceae) in the Guianas, South America Bearing on the Delimitation of Species and Sections." **Warren Wagner** attended the American Society of Plant Taxonomists (ASPT) council meeting as chair of the finance committee. **Laurence Skog** also attended the conference.

The *Heliconia* Society International meeting was held in San Juan, Puerto Rico, from 1 - 6 August. **W. John Kress**, Research Asssitant **Ida Lopez**, Greenhouse Manager **Mike Bordelon** and graduate student **Vinita Gowda** (George Washington University) were slated to attend and conduct field work on *Heliconia* and hummingbirds after the conference. Unfortunately due to airline complications at Dulles International Airport only Bordelon was able to get to the meeting. He gave a presentation on the family Zingiberaceae, titled "A Photographic Survey of the Gingers" and provided a last-minute substitute for Kress by presenting his paper on "The Classification of the Ginger Family." Kress gave his second presentation, "From Cancer to Capricorn—the Tropical Zingiberales of the World," over speaker phone from the Chair's office in Washington, D.C., while Bordelon presented the Power Point graphics.



The report, "Beyond Paradise: Meeting the Challenges in Tropical Biology in the 21st Century," was presented at the annual ATBC meeting.

Cruising the North Atlantic Coast

Walter Adey and wife Karen returned in late September from a three and a half month cruise on the *Alca i*, occupying benthic stations along the entire Atlantic Coast of Nova Scotia and extending into the Gulf of Maine. During the cruise, it was possible to complete a series of quantitative infralittoral and uppermost sublittoral biomass stations in the most difficult to collect of the benthic algal zones.

Recent reviews of western Atlantic rocky shore community structure have concluded that the area from Cape Cod to southern Labrador represents a single ecosystem. Yet, based on intensive, biomass-based field studies undertaken by the Adeys from 2000 to 2003, and supported by the Adey/Steneck theoretical biogeographic model published in 2001, the rocky shore of northern Newfoundland and southern Labrador provides a subarctic core very different in community structure from that of the Maine Coast. Since one could argue that this is primarily the direct result of sea ice scour in the north, the 2004 cruise was undertaken to examine the infralittoral and uppermost sublittoral zones, those most affected by ice scour, on the Atlantic Coast of Nova Scotia. Here the summer temperatures are generally slightly warmer than those in the Gulf of Maine, and yet, because of late winter and spring outflow from the Gulf of St. Lawrence, sea ice scour occurs virtually every winter in the northeast. Rarely, if ever, does ice scour occur in the southwest. This would provide a test of the hypothesis that it is primarily summer temperature in the western Atlantic, and not ice scour, that determines rocky shore community structure.

In Newfoundland and Labrador, the *Chordaria* complex (typically *Chordaria flagelliformis* with lesser amounts of *Scytosiphon lomentaria, Petalonia fascia, Pilayella littoralis* and *Devaleraea ramentacea*) makes up 53 percent of the infralittoral biomass and *Fucus distichus* 46 percent. Although *Chondrus crispus* can sometimes be found after a long search, it did not appear in a single quadrat at 10 stations. In Maine, on the other hand, the *Chordaria* complex shows as a trace with the *Chondrus* complex (*Chondrus crispus* with generally lesser amounts of *Mastophora stellata, Corallina officinalis* and *Palmaria palmata*) at 86 percent and *F. distichus* 4 percent (numerous "Boreal" species make up the remainder of the biomass).

The Atlantic Nova Scotia Coast is typically a few degrees Celsius warmer than the Maine Coast in late summer and 6 to 10 degrees warmer than the northeast Newfoundland and the southern Labrador Coasts. In the southwestern half of the Nova Scotia Coast, the *Chondrus* complex was found to make up 97 percent of the biomass in the infralittoral – both the *Chordaria* complex and *F. distichus* showed as only a trace. On the ice-scoured, northeast Nova Scotia coast, the *Chondrus* complex was down to 83 percent (not significantly different from Maine), the *Chordaria* complex occurred at 10 percent, and *F. distichus* at 3 percent. As in the Gulf of Maine, a number of Boreal species occur at modest levels.

It is tentatively concluded that ice scour may have some minimal effect in providing more bare rock surface for the *Chordaria* complex in northeastern Nova Scotia and therefore a slightly greater presence for this group on this subset of coast. In crevices, boulder fields and polynya, where ice removal is not complete and algal biomass build-up is significant, the *Chondrus* complex remains by far the dominant element, as it is in southwestern Nova Scotia and in the Gulf of Maine. This is not the case in northern Newfoundland and Labrador where the *Chordaria* complex and *Fucus distichus*

highly dominate in the locally-protected infralittoral and *Chondrus* and its associates are rare. A thorough analysis of the data will be undertaken this winter. It appears clear, however, that the Adey/ Steneck model, based on Pleistocene-scale temperature patterns and supported by quantitative field data, remains a better predictor of biogeographic patterns than either presence/absence species data or sea ice scour, even in the critical infralittoral zone.

Mystery Specimen Identified After Stumping Curators for Four Days

By Elaine Haug

While visiting my son in Carpenteria, California, in January, a neighbor asked me to identify a neighborhood tree. I photographed it and took a couple of specimens of the flower and a leaf to bring back for the Department staff for quick identification.

Aaron Goldberg, **Pedro Acevedo** and **Dan Nicholson** were all stumped at first. Acevedo and I did a cross section of the softball-size fruit to discover that it was an inflorescence with both male and female flowers. Acevedo surmised it was a fig, but the leaves were so large that it did not look like other well-known figs. Nicholson waded through fig family material for four days, when finally he came upon *Ficus dammaropsis*, the dinner plate fig. The US National Herbarium has a couple of specimens originating from the native country of New Guinea and another from a foreign botanical garden, but none collected in the U.S.

The plant grows on the grounds of Sea World in San Diego, California. *Ficus dammaropsis*, formerly known as *Dammaropsis kingiana*, is the most striking and popular plant in the amusement park. The leaves can measure 24 inches wide and 36 inches long, ranking them among the largest among the dicotyledons. The leaves of this spectacular small tree are used by the indigenous people of New Guinea for wrapping pork and for lining their cooking ovens. The bark is used in making string and head coverings. The fruits do not develop in California because the wasp necessary for pollination (*Ceratosolen abnormis*) has not been introduced here.

The dinner-plate fig belongs to a genus of over 600 species of mainly evergreen trees of varied habitat in tropical and subtropical parts of both hemispheres, and occasionally in warm temperate areas. Flowers are produced on the inner surfaces of a green, pear-shaped receptacle with a small opening at the top. Gall wasps gain entry through this opening to lay their eggs. After hatching and mating in the receptacle, the young wasps, covered in pollen from the flowers, emerge and fly off to other fig trees of the same species. There they lay their eggs, and in the process, fertilize other flowers. Each species of fig has its own special gall wasp.

Smithsonian Welcomes the President of Mongolia

On July 14, the President of Mongolia, Bagabandi, visited the Smithsonian Institution to witness signing of a Memorandum of Understanding by the Under Secretary for Science David L. Evans and the Mongolian Ambassador Bold. The signing ceremony included the Mongolian Minister of Foreign Affairs Erdenechuluun, the U.S. Ambassador to Mongolia Pamela Slutz, the Head of the Mongolian Buddhists Choijamts, the Directors of the Smithsonian's National Museum of Natural History Cristián Samper, and Freerer/Sackler Gallery Julian Raby, and other Smithsonian and Mongolian guests.

The Memorandum between the Smithsonian Institution and three Mongolian Institutions (the Mongolian Academy of Science, the Museum of Mongolian National History, and the Museum of Mongolian Natural History) will strengthen ties between Smithsonian and Mongolian scientists, scholars, institutions, and museums through collaborative research, scholarly exchanges, collections developments, and new exhibits.

This Memorandum grew out of a multi-faceted research program, the Deer Stone Project, which was initiated in 2000 by the National Museum of Natural History. The project, including Smithsonian scientists William Fitzhugh, **Paula DePriest**, Dan Rogers and Bruno Frohlich, fellow William Honeychurch, and their Mongolian counterparts, has studied the biological diversity of northern Mongolia and its cultural diversity from the Neolithic to Medieval periods.

In June 2004, the Deer Stone Project sponsored a symposia and workshops in Ulaan Baatar, Mongolia. The symposium included a two-day program of professional and public talks, and a series of workshops on museum object conservation, collection management, and GIS mapping. Participants in the workshops included **Deborah Bell**, David Hunt, **Gregory McKee**, and Paul Rhymer, from NMNH, Harriet Beaubien, from SCMRE, and Carolyn Thome, from the Office of Exhibits Central. Bell and McKee presented information on pest management, specimen curation, and collection management to the staff of a number of Mongolian herbaria.

In addition, the National Zoological Park has been involved in the conservation of Mongolian animals. Peter Leimgruber has studied the migration of Mongolian gazelles, and Steve Monfort is the coordinator for the Przewalskis Horse, takhi, survival plan. Smithsonian's Front Royal Center is home to 17 of these wild horses.

Under Secretary Evans presented two gifts to the President of Mongolia in honor of this occasion: a framed print of Przewalskis Horses from the Zoo's *Smithsonian Endangered Species Collection*, and the mineral Smithsonite, zinc carbonite, named after the founder of the Smithsonian Institution, James Smithson. The President presented an original landscape painting to the Smithsonian.

The President of Mongolia was visiting Washington to meet with the President of the United States.

Scientists Meet at Smithsonian to Protect Pollinators

The National Museum of Natural History often works in collaboration with partners throughout the world in efforts to better understand and thereby protect the world's natural flora and fauna.

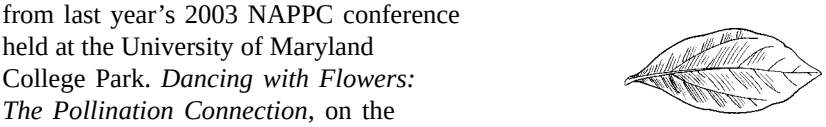
Because of the critical role that pollinators play in nature, over 80 international scientists, educators, and business leaders met at the Smithsonian Institution on 20-21 September 2004 to develop strategies aimed at protecting pollinating species. Collectively known at the North American Pollinator Protection Campaign (NAPPC), this year the consortium assembled to create action agendas to promote and protect pollinators, to review NAPPC committee implementation priorities, and to deploy task forces to undertake and complete short-term activities. The mission of NAPPC, a trinational (United States, Canada, Mexico) public and private partnership of over 50 organizations and agencies, is to promote pollinator awareness, policies, educational outreach, research and conservation.

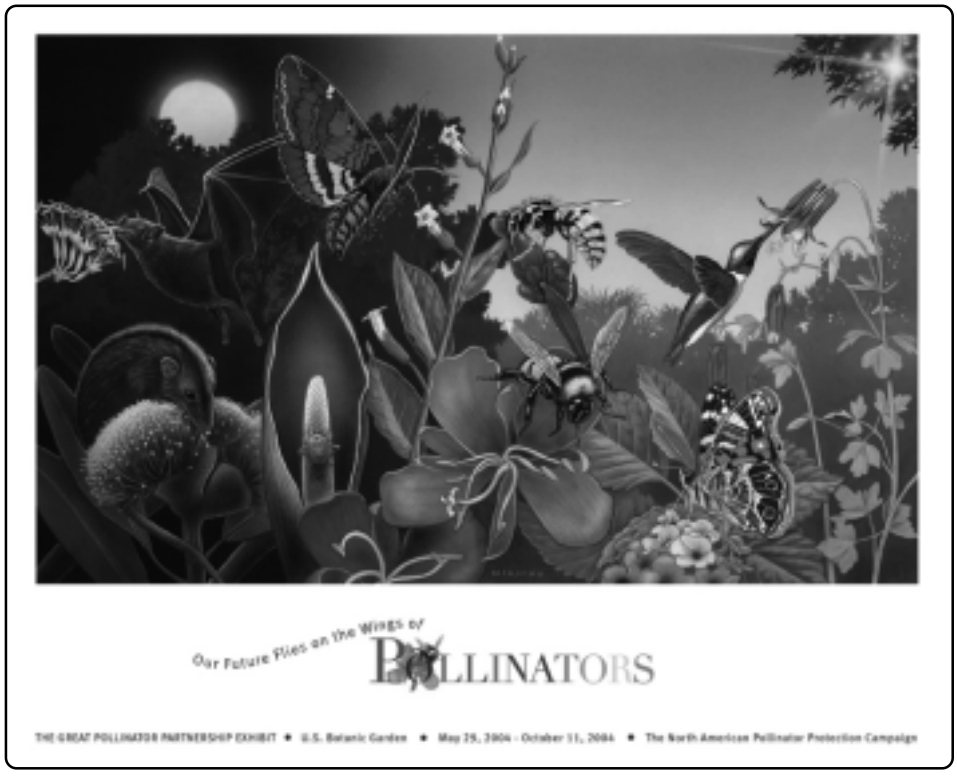
Scientists representing the Smithsonian Institution included **Gary Krupnick** (Botany), **E. Eric Grissell** (Entomology), **Michael Ruggiero** (National Biological Information Infrastructure), and **Alan Peters** (National Zoological Park). Both Krupnick and Ruggiero are members of the NAPPC Steering Committee.

The conference was interactive as attendees participated in one of five committees: Education and Awareness, Conservation and Restoration, Policy and Practice, Research, and Special Partnerships. The goal of the committees is to work on comprehensive long-range approaches to the pollinator issue from distinct categorical perspectives that continue over time.

Attendees participated in Task Forces on the second day of the conference. The goal of the Task Forces is to accomplish a single task in a cross-discipline, short-term, project-oriented grouping. This year's Task Forces focused on building support for a U.S./Canadian/Mexican commemorative stamp series on pollinators; ways to work with the Environmental Protection Agency's Pesticide Environmental Stewardship Program (PESP); bee trafficking and policies needed to protect existing pollinating species in any given area; increasing participation in NAPPC by government agencies and industry in Canada and Mexico; and designing an experimental restoration project to assess the impact of restored pollinator habitat on crop productivity.

On the evening of 20 September, NAPPC participants and other distinguished guests enjoyed guided tours of the "The Great Pollinator Partnership" exhibit and a sumptuous array of pollinator-assisted foods and beverages at the United States Botanic Garden. The past successes of NAPPC were evident at the Garden, as two exhibits currently on display were the products of task forces from last year's 2003 NAPPC conference held at the University of Maryland College Park. *Dancing with Flowers: The Pollination Connection*, on the Garden Terrace, is comprised of twelve pollination gardens, each devoted to a different theme, demonstrating who visits whom, when, and how. Individual gardens feature plants that attract bats, bees, butterflies, and other pollinator groups. It is designed to help the viewer understand why the future, the global economy, and the survival of fine dining depend on pollinators. Inside the West Orangerie is *Dynamic Duos: Plants and Pollinators*, a photographic journey that invites the public to examine closely the subtle magic that occurs when pollinator meets plant. Created from over 400 entries submitted by world-renowned photographers, these images are a tribute to the bees, butterflies, beetles, birds, bats, flies, wasps, and other species that perform the prodigious and vital work of transferring pollen.





Artist Paul Mirocha designed a stunning educational poster for NAPPC depicting an array of pollinators and plants to promote the "Great Pollinator Partnership" exhibit at the United States Botanic Garden.

Any Tuesday

By Heijia L. Wheeler, Volunteer

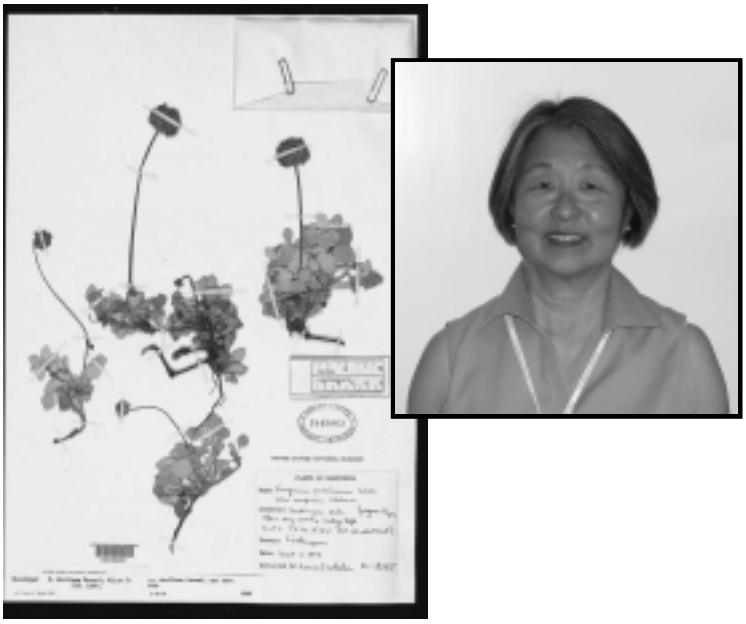
On almost any Tuesday during the summer of 2004, if you had looked in room W516 of the West Wing of the National Museum of Natural History, you would have seen three or four people sitting by computers, all busily entering data or digitizing images. Several others would come in to stash their lunches and backpacks then head down to the fourth floor to work on the voucher collections, the historic maps, or the loan data base. These are all volunteers in the Department. They have all come to help with more than half dozen projects overseen by **Rusty Russell**. Although these volunteers come in throughout the week, almost all of them were there on Tuesdays.

At about noon, someone realizes that they need lunch, and the volunteers look up from their work and drift upstairs to W516. At the center table, under the blast of arctic air from the ceiling air conditioning vent, they enjoy lunch and each other. Their ages range from 17 to over 60. Around the table eating their lunches, they share recent travels, movies that they have seen, and the work they are doing that day. There is a lot of laughter and people walking by the door peer in looking for the source of mirth. After lunch, the volunteers all go back to the work they were doing that morning.

These are special people. Many have retired from high level jobs in a variety of fields. Most are not botanists but they are intelligent, successful, with many years of work and life experiences. The investment of time in training is really quite small when you see the work these people give back. The main problem with many of these projects is the mind numbing repetitiveness, while requiring a person to be accurate, and make critical decisions. There were nearly 20 volunteers that fit this job description perfectly. So how do you convince such well educated, bright, hard working people to do this work for free?

They are initially given the scope and purpose of the project, the goals and the significance of the work to the mission of the Department. This initial investment of time makes the work much more meaningful for the volunteers. In some cases, it is the volunteer who develops the methods and procedures for the project. They are given the freedom to use their creativity, experience and talents to solve the problems. The result is that the work becomes much more gratifying for them.

Volunteers fall into three broad categories. The first are the retirees who have had productive careers as engineers, scientists and administrators. They are looking for ways to make a contribution and they bring a vast array of talents and experiences with them. The second group is those looking for paying jobs. They are often new to the area and while job hunting, they volunteer their talents. They may be here for a relatively short time, but are exceptionally productive while here. The third is the students who are looking for something to do for the summer. Again they are around for only two to three months, but they bring youthful energy and enthusiasm to the place.



The type specimen of *Eriogonum diclinum* Reveal, J.L., collected by Louis Cutter Wheeler in the Siskiyou Mountains, California, in 1934. Inset: Heijia Wheeler, niece of Louis Cutter Wheeler, and Department volunteer.

When I began as a volunteer in January 2004, I had just moved back to the D.C. area from Florida where I spent 34 years in the state's higher education system. My husband and I always planned to retire here. We both grew up here, went to George Washington University, and I majored in Botany. As an undergraduate, Walter Shropshire gave me a part time job at the Radiation Biology Lab which was housed in the basement of the Smithsonian Castle and I took several courses with Kitty Parker.

I find that retirement requires huge adjustments. Going from a job as the academic vice president, when I had no personal time, to retirement, when the entire day was mine to structure, was a huge leap. So my husband and I agreed to edit a journal for the American Chemical Society, he edited a book, and I have done peer reviews for the National Science Foundation (NSF). I also wanted to reconnect with my past and wandered into the Smithsonian to volunteer.

My first assignment was to comb the entire herbarium to find vouchers for the San Jacinto Project. This project is a cooperative venture of the Smithsonian, State of California and private organizations to develop place-based land management and education tools. The site chosen for this project is the San Jacinto Mountains in Southern California, near Palm Springs.

The Smithsonian's contribution to this project is to document the specimens collected in Santa Rosa County, San Jacinto Mountains National Monument and adjacent areas that are on file at the Smithsonian. This required the search of the entire herbarium for mounted vouchers, some of which were collected in the early to mid 1800s.

This project gave me a chance to

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Department Staff "Go Where They Grow" at USBG

A new exhibit featuring the plant exploration work of Department staff botanists opened at the United States Botanic Garden on 22 July. Cosponsored by the Department, "Going Where They Grow: Exploring on the Front Lines of Botany" will be on display in the USBG Conservatory's Plant Exploration room through 14 November.

From the Pacific to the Caribbean, from Mexico to Southeast Asia, plant species – even entire plant communities – are vanishing along with the knowledge of their usefulness to native cultures. Some individuals are at work to save what is left, while others are struggling to know what is there. Staff botanists travel throughout the world, surveying disappearing natural habitats and preserving specimens for the U.S. National Herbarium and for other botanic institutions around the globe. Their work is key to preserving each country's national heritage as the scientists record local ethnobotanical knowledge and assist in each nation's race against the loss of biodiversity.

By focusing on four distinct regions around the world (the work of **Warren Wagner** in Hawaii, **Pedro Acevedo** in Hispaniola, **Paul Peterson** in Mexico, and **W. John Kress** in Myanmar) and including living specimens of plants collected during travels to those regions, "Going Where They Grow" gives visitors a taste of "roughing it" on long, arduous plant expeditions to remote areas. Also featured in the exhibit are "tools of the trade" that showcases plant-collecting equipment and other paraphernalia used by botanists on expedition. More information about the exhibit is available on the Department Web page <http://persoon.si.edu/goinggrow/goinggrow.html> and the USBG Web page <http://www.usbg.gov/education/events/Going-Where-They-Grow-Exploring-on-the-Front-Lines-of-Botany.cfm>.

Department staff are featured in a new exhibit at the United States Botanic Garden, "Going Where They Grow."

Tuesday

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become familiar with the entire herbarium since the list of species on the San Jacinto Project was huge. I found this project personally engaging as well. My father-in-law, Willis Hayes Wheeler and his brother Louis Cutter Wheeler were both botanists, and native Californians. Uncle Louis was a prolific researcher at University of Southern California and left most of his collection to Harvard, his alma mater, but many of his vouchers are here at the Smithsonian. Dad, was a plant pathologist as well as a very good botanist and worked at the USDA for many years. They grew up in Southern California before the pollution and congestion, and they roamed all over the foothills and the mountains in the region. While searching for vouchers from this area, I was delighted to find many of Uncle Louis' specimens, with his hand written notations. I also found some that my father-in-law had collected. It is hard to describe the feeling of connection I had with both Dad and Uncle Louis as I held these tangible folders that were more than 70 years old.

Another project I have become involved in is the Plummer's Island Project. The Smithsonian Institution, Columbia University and the University of Maryland, College Park were awarded a five year grant from NSF to develop a unique imaging process for remote identification of plants. The project will develop a way to find unique leaf features of about 300 plants found on Plummer's Island for identification via remote digital images. The images of plants will be on file at a central server and accessed from the field. This will be done via wireless access and tiny video cameras that can call up the main data base and match the specimens on file with specimens collected in field.

Over 40 years ago, while a student at George Washington University, I took a course in Field Botany with Kitty Parker who used Plummer's Island frequently as a collection site. I was dating a chemistry major at the time and talked him into taking the course with me. We just celebrated our 40th wedding anniversary last June. Botany can have powerful influences in more ways than meets the eye.

The 2005 Smithsonian Botanical Symposium, 15-16 April, to explore the Future of Floras

In conjunction with the United States Botanic Garden, the Department of Botany is proud to announce the 2005 Smithsonian Botanical Symposium, **"The Future of Floras: New Frameworks, New Technologies, New Uses,"** to be held at the National Museum of Natural History in Washington, D.C., on 15 – 16 April 2005.

For centuries botanists have created regional floras for the purposes of inventory (to know what taxa are present in an area), identification (to know the names of the taxa we find or study), description (to know more about the taxa of a region than we currently do), and classification (to know how taxa are related to other taxa within as well as outside the focal region). But what will the floras of the future look like and what will they be able to do that they do not or can not do today? Will there even be a need for floras in several decades when a web-based "Encyclopedia of Life" becomes a reality? In fact what will field taxonomists be doing in 20 years?

New technologies are now being developed to greatly facilitate the coupling of field work and plant discovery with ready access and utilization of data about plants that already exist as databases in biodiversity institutions, such as herbaria, natural history museums, and botanical gardens. The development of electronic field guides, on-line keys, and image identification systems that operate on the web, laptop computers, and personal digital assistants as well as efficient, inexpensive, and portable DNA barcoding methods to identify plant species in the field have great potential to augment if not completely replace the traditional paper-based regional flora.

Some scientists remain concerned, however, that new methodologies and technologies that may further the "Linnaean enterprise" (i.e., the inventory, identification, and classification of life) may also threaten the field of taxonomy. Will these new technologies replace taxonomic specialists who work directly with specimens? Can these new techniques be misused and provide faulty identifications? These are legitimate concerns. The proponents of the new technologies believe that the easier it is for end-users to employ good taxonomic data for identification (i.e., through systems such as web-based floras and rapid DNA barcoding), the more taxonomists will be appreciated by the scientific community as well as the lay public for their skills and knowledge.

As the debate continues, floras built on web-based, computer-based, image-based, and DNA-based products are taking on new forms and fulfilling new functions that word-based and paper-based floras have not been able to attain. All of these topics focusing on the floras of the future will be discussed and debated at the symposium.

Six invited presentations will explore (1) the past, present, and future uses of floras and checklists, (2) on-line keys, (3) innovations in digital image recognition, (4) electronic field guides, (5) the prospects of plant DNA barcoding, and (6) the problems associated with plant DNA barcoding.

The fifth 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.

For more information about the 2005 Smithsonian Botanical Symposium, visit <http://persoon.si.edu/sbs/> or call 202-633-0920. In addition, registration will soon be available at this Web site.

Genes are Transfered in Plants

Research Associate **Kenneth Wurdack** and collaborator Charles Davis published a study in the July 30 issue of *Science* showing that a parasitic relationship may facilitate horizontal gene transfer between flowering plants. The direct, physical contact between a parasitic plant and its host plant, may allow the genes from one to move to the other, something that usually only happens during sexual reproduction. The movement of genes between sexually unrelated organisms has long been known to be a major force in bacterial evolution but it is rare in eukaryotes.

Wurdack was examining the evolutionary relationships of the *Rafflesiaceae*, parasitic plants so reduced and bizarre in appearance (lacking leaves, stems, roots, etc. and taking all nutrition from their hosts) that their phylogenetic relationships have been speculative. The plants are entirely maintained by their Vitaceae (grape family) hosts except for their flowers (and fruits). These flowers can be spectacular, including the largest flower in the world, which can be three feet in diameter.

Earlier this year other researchers found a single mitochondrial gene that gave an entirely unexpected placement of Rafflesiaceae with Malpighiales on which Wurdack conducts his research. Wurdack and his colleague followed up by comparing larger gene phylogenies and found three genes in Rafflesiasceae from both the nuclear and mitochondria genomes that yielded similar results and reflected Malpighiales affinities, but a fourth gene, mitochondrial nad1B-C, grouped Rafflesiaceae with their hosts. Wurdack and Davis therefore concluded that the three genes agreed with the other researcher's results, placing Rafflesiaceae with Malpighiales, but the fourth gene conflictingly placed the group with their host, the grape family, leading to the suggestion that there had been, in the past, a transfer of genetic material from the host to the parasitic plant. It is thought that these discordant phylogenetic hypotheses strongly suggest that part of the mitochondrial genome in Rafflesiaceae was acquired via horizontal gene transfer from their hosts.

Profile

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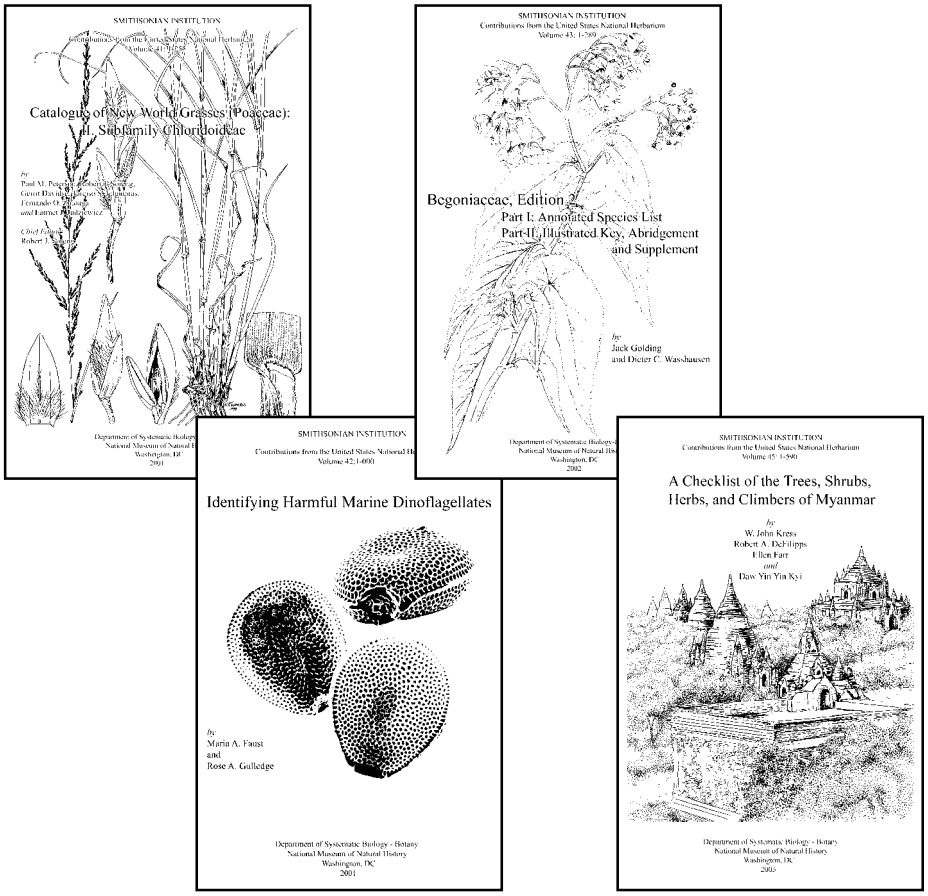
published regularly in both the *Proceedings of the U. S. National Museum* and the newly created *Bulletin of the Botanical Division* (USDA). Over the next ten years, the publications put out by the USDA rapidly multiplied. Each division (of which there were 27 in 1897) issued circulars and special circulars, bulletins and special bulletins, reports, special reports, and annual reports. One critic noted that these miscellanies were "unduly padded, the truly valuable matter which occasionally appears in them being buried among a mass of valueless material, apparently prepared from a spirit of rivalry between the different bureaus and divisions" (*The American Naturalist* 31: 971-973. 1897.)

Vasey soon realized the importance of having a publication devoted to disseminating the results of research engendered by the ever expanding National Herbarium. He wanted a publication specifically addressed to professional botanists, but still available to anyone who asked for a copy. On 16 June 1890, the USDA issued the first *Contributions from the United States National Herbarium*. Authored by Vasey and J.N. Rose, it was a 28-page pamphlet that listed the 1888 collections of Edward Palmer in southern California. The series was immediately hailed as a valuable addition to scientific botany:

> The Department [of Agriculture], as well as the Botanist [Vasey], is to be congratulated upon the evident desire to cultivate botany for its own sake, and to use some of its money and material in rendering service to the botanical world, as well as to purely agricultural interests. Anon. 1892. *Botanical Gazette* 17: 129.

The USDA continued to publish the *Contributions* until 1902, when Congress appropriated monies for the Smithsonian Institution to take over the publication, beginning with Volume 8. The Institution also reissued the first seven volumes, which had quickly exhausted their initial print runs, demonstrating the rapid rise to popularity of the series. After 1905, the *Contributions* was published as part of the *Bulletin of the National Museum* series, but retained both its own numbering for the volumes and its own identity.



A selection of recent issues of the *Contributions to the United States National Herbarium* series.

Despite the change in ownership, the *Contributions* remained an outlet for research involving the National Herbarium, regardless of the institutional affiliation of the author. For example, Volume 6 (1901) was dedicated to Charles Mohr's *Plant Life of Alabama* and Volume 9 (1905) to W.E. Safford's *Useful Plants of Guam*. Neither of these authors were directly associated with either the Smithsonian or the USDA at the time. A broad range of topics and specialties also characterized these early volumes. Collector lists, taxonomic descriptions, nomenclatural puzzles, regional floras, ethnobotany, economic botany, and pharmacological accounts could be found intermixed in one volume. Year after year, critical studies and seminal works were published in *Contributions*, making it one of the most important publications in American botany. The *Contributions* series was discontinued in 1972, when it was superceded by the *Smithsonian Contributions to Botany*, published by the Smithsonian Institution Press.

Unfortunately, the *Smithsonian Contributions to Botany* series suffered setbacks in efficiency and timely publication that rendered it ineffectual for the dissemination of scientific research. At the same time, Smithsonian botanists had come to rely more and more on large databases to hold and organize the results of their researches. Seeking an appropriate venue to publish the often lengthy results of that accumulated data, the *Contributions from the United States National Herbarium* was resurrected in 2000 by the Department of Botany. Using donated labor and significant portions of departmental resources, camera-ready copy was supplied to an outside contractor. After the volumes were printed, they were shipped back to the Smithsonian to be mailed out to over 1,200 individuals and institutions, using donated labor within the Department.

Four years, thirteen volumes and almost 4,000 pages later, the renewed series has continued more than just the numbering of the old volumes. It is continuing its spirit as well. The works continue to be peer-reviewed and are still

available free of charge to anyone who requests a copy. It has also acquired the role of an exchange publication for the Smithsonian Libraries. Over 200 botanical journals are received in exchange for this series. More importantly, the *Contributions* is again recognized as a significant vehicle for disseminating the results of scientific research at the U.S. National Herbarium.

The frenetic pace of the post-modern world has also infected science, even ancient and venerable fields such as botany. People expect instant access to high-resolution images and primary data sources, an ability to construct complex queries, and drill-down data from global syntheses to absolute plots of individual plants. Scholarly journals now have supplemental Web sites devoted to housing the data that would overwhelm a print edition. Printed errata and additions no longer have the same meaning now that databases are easily updated by collaborators working halfway around the globe. The world is awash in data and the revitalized *Contributions* series must meet the expectations of scholars and the public at large.

At the most basic, a digital version of the print text should be available on the Web. Equally as important though, the large datasets that underpin many of the *Contributions* volumes must also be accessible. The Department has already made substantial progress in the design of Web interfaces for these databases. While access to primary data will continue to be important, the *Contributions* series must also continue to be a venue for the scholarly narrative. Raw data, in and of itself, will never be the entire story. The Web presence of the *Contributions* series could be the place to contextualize the scientific research published in its volumes. It could be a place to engage the public's interest in the work of Smithsonian scientists.

The final question to be asked is what to make of those volumes of the *Contributions*, sitting on library shelves around the world? The resources are not yet available to tackle the tens of thousands of pages generated by Smithsonian botanists over the 80 years of the first *Contributions* run. Nonetheless, someday these too must be brought into the digital age. The explosion of on-line journals and archives are fundamentally altering the nature of scholarly research. A particularly instructive example is provided by JSTOR <http://www.jstor.org>, the largest on-line archive of printed scholarly journals, whose volumes date from the 18th century to the late 20th century, but do not include the most recent issues published by a journal. Despite being a subscription service, usage statistics of JSTOR indicate an exponential growth in searches made of older volumes of journals. The number of downloaded and printed articles is much higher than one would have supposed given the number of citations, when these articles were available only in print form. Clearly much valuable work and primary data had been lost, because indices were limited and no one had the time to go back and read back issues, even within their specialty. With the ability to quickly search the complete texts of millions of articles at once, researchers are taking advantage of this new resource. But once the novelty wears off, it will become a baseline expectation for all repositories of scholarly work, and the Smithsonian will have to digitize archives of its scientific publications in order to match the rising expectations of both scientists and the general public.

In conclusion, there can be little doubt that *Contributions from the United States National Herbarium* has been reborn in an era much different from its original conception. Botanists are more specialized. Systematics has been revolutionized by molecular data and computers. Ecology and biogeography have fundamentally altered perceptions of the relationships among species. The questions that scientists ask have certainly changed over the last hundred years, but the National Herbarium remains an important source for the answers. The revitalized *Contributions* series is once again an important vehicle for bringing both the questions and the answers to the scientific community and public at large. There are many challenges ahead, increased printing costs and more strenuous expectations from the scholarly community, being just a few. Nonetheless, the Department remains committed to seeing the production of their scientific research "sent forth to the world" through every conceivable medium, including the flagship, *Contributions from the United States National Herbarium*.

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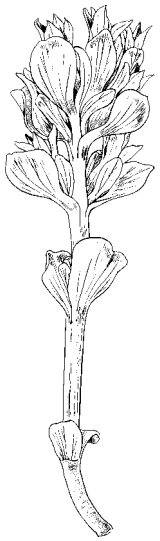
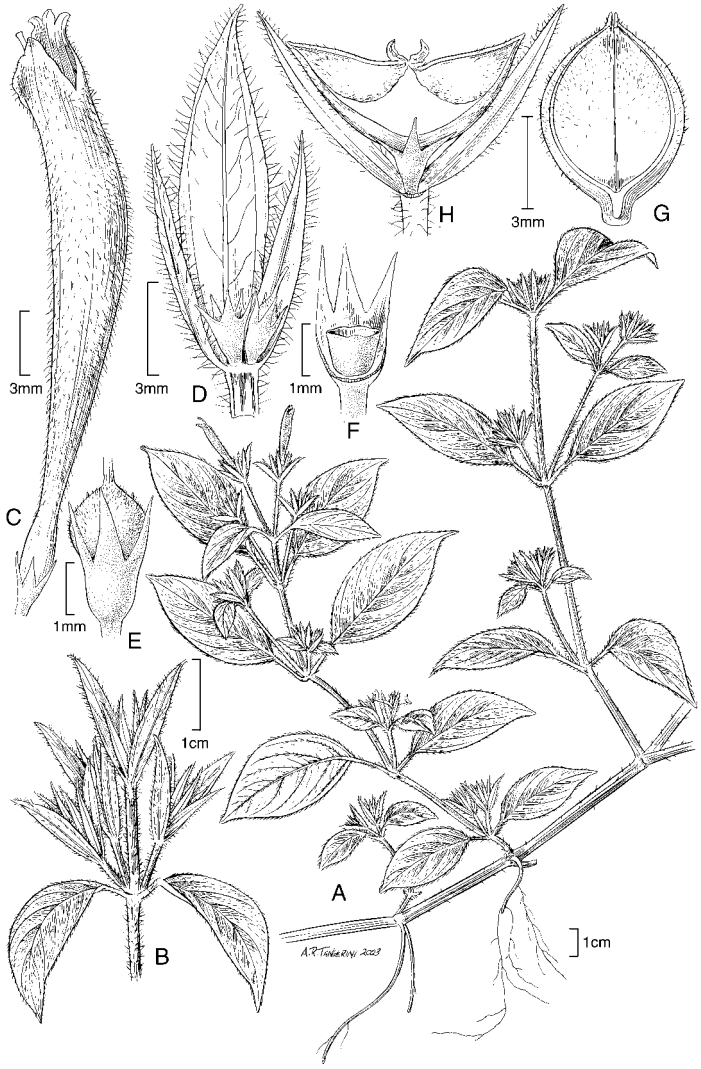


Art by Alice Tangerini

Dicliptera palmariensis Wassh. & J.R.I. Wood

Alice Tangerini's illustrations have graced the covers of eight issues of the *Contributions from the United States National Herbarium* series since the year 2000. Along with freelance illustrators Cathy Pasquale and Peggy Duke, Tangerini provided many of the illustrations in Dieter C. Wasshausen and J.R.I. Wood's treatment of the Acanthaceae of Bolivia (Vol. 19. 2004). Two new species of *Dicliptera*, including *D. palmariensis*, were described and illustrated for the first time. *Dicliptera palmariensis* is a rare endemic species restricted to tropical forest in the El Palmar area near Villa Tunari, Bolivia.



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