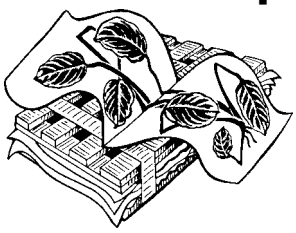
Department of Botany and the U.S. National Herbarium



The Plant Press

Smithsonian
National Museum of Natural History

New Series - Vol. 3 - No. 2 April-June 2000

Department Profile

Island of *Madagaster* Yields Plant Treasures

By Robert DeFilipps

Not unexpectedly, Madagascar, the fourth largest island in the world, is the home of *Madagaster*, a genus comprising five endemic species of Asteraceae. These unexploited composites represent only a fraction of the endemic plants, many others of which have become cosmopolitan tropical ornamentals, that were discovered in this gigantic island, which is only 50 square miles smaller than the Brazilian state of Minas Gerais. Isolated in the Indian Ocean east of Mozambique, Madagascar's flora comprises around 6,000 endemic plant species, equivalent to 80 percent of its total flora. There are six endemic families, including the arborescent, characteristically spiny Humbertiaceae (named for J.H. Humbert, 1887-1967) and equally spiny Didiereaceae (named for A. Grandidier, 1836-1921); spineless trees would be pointless in these dry habitats. By way of contrast to the enormous size of Madagascar (Malagasy Republic) at 226,657 square miles, the neighboring, but less frequently contacted Comoro Islands (Great Comoro, Anjouan, Mayotte, Moheli), occupy exactly the same recorded area as Plymouth County, Iowa or Hyde County, South Dakota (863 square miles).

The botanical gifts once endemic to Madagascar, which now boldly exhibit an "aspect dominance" wherever they have been planted in the tropics and subtropics, or when grown as indoor house plants, are a parade of desirable species including the traveler's tree (*Ravenala madagascariensis*, Strelitziaceae); the crassulaceous panda plant (*Kalanchoe tomentosa*) and flaming Katy (*K. blossfeldiana*); crown-of-thorns (*Euphorbia milii*); the water-loving umbrella sedge (*Cyperus alternifolius*); the blue-leaved Chancellor's palm (*Bismarckia nobilis*); yellow butterfly palm, the most abundantly cultivated ornamental palm in the world (*Dypsis* (*Chrysalidocarpus*) *lutescens*); the fenestrated Madagascar laceleaf plant, an aquarist's dream (*Aponogeton madagascariensis*); the Madagascar periwinkle, highly decorative and containing 60 alkaloids, some valuable for treating forms of cancer such as children's leukemia (*Catharanthus roseus*, Apocynaceae); the ubiquitous red-flowered "flamboyant" (*Delonix regia*, Caesalpiniaceae); and the purple-spined, though regrettably non-suckering, *Pandanus utilis*. Carnivorous plant fanciers seek *Nepenthes madagascariensis*. Unfortunately, by contrast, scarcely any food plants originated in the region; seemingly as compensation vanilla growing is a major industry in both Madagascar and the Comoro Islands today.

Over the last few centuries, Madagascar's oddly shaped plants with bulging trunks and other adaptations, as well as their more conventional and colorful cohorts, were eventually discovered and collected for scientific study, as well as for germplasm to enhance the field of horticulture, often under very physically (and financially) taxing conditions. Authoritative information on the people who strove to find these plants has been ably presented by Laurence J. Dorr, Associate Curator in the Department of Botany, in a comprehensive book entitled *Plant Collectors in Madagascar and the Comoro Islands*, published by the Royal Botanic Gardens, Kew in 1997. It is a landmark for being the first book published by Kew, or by a Smithsonian botanist, to be provided with an accompanying CD-ROM.

In the book one can find the biographies and itineraries of numerous well known collectors such as Wenceslas Bojer (1795-1856) who discovered *Delonix regia* at Foulpointe in eastern Madagascar (evidently as an introduction from the west coast by Arab settlers), and of Jacques Leandri (1903-1982) who rediscovered the delonix in its original habitat in the west at Antsingy Forest Reserve in 1932. That is the type of adventure that Dorr enjoys communicating, and his numerous papers on other figures in botanical history bear it out. Additionally, under Dorr's own entry in the volume, we find that he was born in Boston, Massachusetts; received a B.A. from Washington University, St. Louis, Missouri (1976), an M.A. degree from the University of North Carolina at Chapel Hill (1980); and his Ph.D. from the University of Texas at Austin in 1983.

Representations of collectors in the book include several other Smithsonian botanists of the past and present who were privileged to visit Madagascar over the years, including the preeminent Pacific ecologist F. Raymond Fosberg, and W. John Kress, current Chairman of the Department. The latter's work involved a study of the likely pollination of the traveler's tree (*Ravenala*) by visiting lemurs, who grasp the overlapping

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Travel

Mark and Diane Littler (12/16 – 2/17) traveled to Fort Pierce, Florida to continue an ongoing research project at the Smithsonian Marine Station and the Florida Keys, and (3/14 – 4/5) to Belize City, Belize to study the ecology of Siphonalean algae of the Carrie Bow Cay area.

Dan Nicolson (1/22 – 2/6) traveled to Berlin, Germany to attend meetings of the committee to revise the International Code of Botanical Nomenclature as a member of the Editorial Committee, and Moscow, Russia to work with staff of the Moscow University collections department.

Maria Faust (2/2 – 2/130) traveled to Melbourne, Australia to attend the 9th International Conference on Harmful Algal Blooms in Hobart, Tasmania, and (3/26 – 4/1) to Palm Beach, Florida to study and collect dinoflagellate algae in the Indian River ecosystem.

Vicki Funk (3/1 – 3/17) traveled to Georgetown, Guyana to meet with officials at the University of Guyana and government agencies; and (3/27-4/9) to Belize City, Belize and Lincoln, Nebraska to conduct research and attend a National Science Foundation workshop.

W. John Kress (3/1-3/6) traveled to London, England to conduct research at the herbarium of the Royal Botanic Gardens, Kew; to Durham, North Carolina (3/28 – 3/29) to attend the preliminary examination for graduate students at Duke University; and (4/1-4/26) to the Canary Islands, Spain to attend the "Global Integrated Plant Conservation Initiation" in Las Palmas, and then to Bangkok, Thailand and Rangoon, Burma to conduct research and collaborate with Burmese botanists.

Barrett Brooks (3/14 – 4/5) traveled to Belize City, Belize to study ecology and biology of Siphonalean algae of the Carrie Bow Cay area.

Warren Wagner (3/29-3/31) traveled to Kansas City, Kansas to present a lecture at the Department of Ecology and Evolutionary Biology, University of Kansas; and (4/17-4/20) to San Antonio and McAllen, Texas to collect specimens for a molecular study of *Phaulothamnus* (Achatocarpaceae).

Gary Krupnick (3/30-3/31) traveled to St. Louis, Missouri to meet with Peter Raven regarding the creation of a Center for Conservation and Sustainable Development at the Missouri Botanical Garden. Future potential collaborative projects with the Botany Department's Plant Conservation Unit were discussed.

Deborah Bell (4/4 – 4/27) traveled to Bangkok, Thailand and Rangoon, Burma to work with Myanmar herbaria staff to database plant collections.

Ida Lopez (4/4 – 4/27) traveled to Bangkok, Thailand and Rangoon, Burma to work with Myanmar herbaria staff to database plant collections.

Michael Bordelon (4/6 – 4/26) traveled to Rangoon, Burma to work in Myanmar herbaria and conduct field studies.

Pedro Acevedo (4/10 – 4/22) traveled to San Juan, Puerto Rico and Tortola, Virgin Islands to train Virgin Islands National Park Trust personnel.

Laurence Skog (4/27 – 5/3) traveled to Bronx, New York to examine specimens in the herbarium of the New York Botanical Garden, and (5/12 – 5/15) to Baltimore, Maryland to participate in the Association of Systematics Collections meeting.

The Plant Press

New Series - Vol. 3 - No. 2

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New Faces

Andrew Medina-Marino has joined the plant research group at the Laboratory of Molecular Systematics (LMS) as a contract worker. He worked last year for **Elizabeth Zimmer** and this spring for Scott Wing as an intern through the Smithsonian's Office of Fellowships and Grants.

David Erickson, recent Ph.D. graduate from the laboratory of James Hamrick at the University of Georgia, has joined the LMS and the University of Maryland to work on a National Science Foundation grant to Charles Fenster and **Elizabeth Zimmer**, on quantitative genetics of epistasis in a species of *Chamaecrista* (Fabaceae).

Visitors

Arsenio Jose Areces Mallea, Instituto de Oceanologia, La Habana, Cuba; Caribbean *Laurencia* (Rhodophyta) (4/22-4/30).

Ricardo Callejas, Universidad de Antioquia, Colombia; Piperaceae of the Guianas (4/24-4/28).

Ralf Bauer, Offenberg, Germany; *Selenicereus* (Cactaceae) (5/1-5/6).

Janice Saunders, Instituto Darwinion, San Isidro, Argentina (SI); *Waltheria* (Sterculiaceae) (5/12-5/16).

Maurice Edwards, University of Tennessee at Chattanooga (UCHT); *Iris verna*, *Phytolacca americana* (5/15-5/19).

Aaron Liston, Oregon State University (OSC); *Thalictrum* (Ranunculaceae) (5/17-5/21).

Biology: Challenges for the New Millennium

What lies ahead for the field of biology and biological scientists in the next century? For three days in March, 500 biologists and educators met at the Smithsonian to listen to the thoughts of some of the most preeminent biologists of our times and to discuss among themselves this very question. The meeting was organized by the American Institute of Biological Sciences and the National Museum of Natural History as an effort to address the present and future of biology from the perspectives of evolution, ecology, morphology, development, behavior, systematics, and conservation, as well as an integration of all of these disciplines. The presentations and interactions were a mixture of review, originality, synthesis, and thoughtful speculation.

Discussions were initiated by one of the principal architects of the "Modern Evolutionary Synthesis," Professor Emeritus at Harvard Ernst Mayr, who provided a first-hand account of the efforts in the 1930s and '40s to integrate the disciplines of natural history and genetics into a unified field of evolutionary biology. At 95 years of age he looked ahead to the challenge of bringing developmental biology into the realm of evolutionary study. He also advised that students aspiring to become evolutionists should have a firm understanding of natural history, should not be too narrow in their study, and should be sure to "look over the fence into neighboring fields."

Professor Sir Ghillean Prance provided the first reference of the meeting to our biologically stressed planet and noted that we still have so much to learn about the diversity of life. Over 20,000 new species of vascular plants have been described over the last 20 years, clearly indicating that as systematists we have much work to do in our inventory of the world's taxa. He also succinctly challenged biologists to accept the responsibility of addressing the political nature of what we do as natural historians.

The palaeontological and evolutionary perspectives on the future of biology were provided by Professor Stephen J. Gould in a whirlwind discourse on "Darwinism Today" (also the title of a volume first published in 1907!): the interaction of science, religion and the humanities. He discussed the major successful interactions of the last 20 years in genetics and phylogeny (the "Big Tree of Life"), evolution and development, biodiversity, and the microcosm. But he recognized that the essential question of "What is life?" is still unanswerable due to the fact that so far we know of only a single experiment available for analysis.

Dr. Gene Likens recognized that interactions between natural ecosystems and society must be a major focus of biologists in the near future. He stressed the practical aspects of scientific team building, the evaluation of ecological complexity, the accumulation of long-term environmental data, and the use of new technological tools as priorities for facing ecological issues in the future.

Morphology, as the structural basis for an organism's interaction with the environment, and development, as the process by which morphology is achieved, were the topics of Professor Marvalee Wake's address. The monogamous marriage of developmental studies with evolutionary theory is clearly the foundation of a new, if not rejuvenated, discipline in the biological sciences. She speculated on the future polygamous relationship of developmental biology with evolutionary, ecological, genetic and molecular sciences as well.

Dr. Lynne Margulis defended the "Gaia Hypothesis" as a rationale approach to understanding the relationship of the biota to the biosphere. Her explanation and exploration of the microcosm was a new window onto the microbial world for many of the participants.

How does animal behavior intersect with modern concepts of evolutionary and ecological theory? Professor Gordon Orians recognized that it is hard for us to admit that the concept of free will may be compromised by an evolutionary explanation of human behavior. Nonetheless the growing evidence supports a Darwinian explanation and understanding of behavioral traits and characteristics (of both animals and plants!). He also stressed the recent use of phylogenetic data as a powerful tool in the study of the evolution of behavior.

The "gardenification of nature" was a central theme in the thoughts of Dr. Dan Janzen, prince of tropical ecology and conservation. After years of effort in Costa Rica he admitted that we will never have a smooth transition between society and the preservation of biodiversity. We must "know it (i.e., biodiversity) and use it in order to save it." He demonstrated and justified the importance of parataxonomists in biological and conservation programs as well as the recognition of ecosystem and biodiversity services to society.

Professor Edward Wilson completed the stellar cast of plenary speakers in his address on biology and human society. He continued his call for consilience of knowledge across disciplines and suggested that the great future frontiers of biology are 1) evolutionary genomics, 2) biodiversity research, 3) large scale community ecology, and 4) linkage of biology to the humanities and the social sciences. Human nature is the product of the epigenetic rules of our evolutionary history and must be understood within the perspective of our biological nature.

These exemplary presentations formed the basis of a final round table discussion among the lecturers moderated by conservationist Dr. Thomas Lovejoy. Comments by the speakers were universal in that a consilience of societal issues and biological processes

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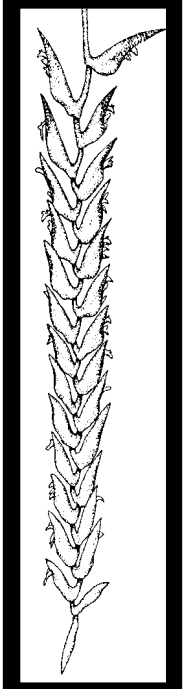
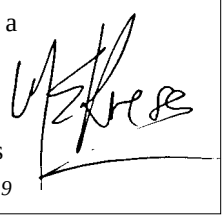
Chair With A View — W. John Kress





Staff Research

Laurence Dorr collaborated with Douglas Holland, Archivist of the Missouri Botanical Garden, in compiling a bibliography of the publications of Joseph Ewan (1909-1999) [see also Publications in this issue]. The bibliography, which contains over 450 citations, will appear in the October 2000 issue of the *Archives of Natural History*. Ewan, who is best remembered as an historian of botany, was briefly (1945-46) an Assistant Curator in the Division of Plants and later (1984) a Regent's Fellow, both at the Smithsonian.

Robert Faden continued working on floristic treatments of Commelinaceae for the *Flora of Tropical East Africa* and *Flora Zambesiaca* at the Royal Botanic Gardens, Kew on 14 February-18 March. Spirit material of flowers of an undescribed *Commelina*, from a 1937 Zambian collection, enabled him to complete a description of the species, which is to be called *Commelina milne-redheadii*, in recognition of the collector, E. Milne-Redhead, first editor of the *Flora of Tropical East Africa*, for his many invaluable specimens of Commelinaceae with detailed floral descriptions and liquid-preserved flowers.

Paul Peterson visited Chihuahua, Mexico on 27 February-4 March to attend a planning meeting for the Tarahumara Biodiversity Project spearheaded by National Museum of Natural History anthropologist, William Merrill. A group visited the Sierra Mohinora in the southwestern corner of the state to assess its suitability for biological study. The desert and mountains at this time of year in northern Mexico were very dry. Peterson continued to northern Peru on 8 March-11 April to collect grasses and collaborate with Oscar Tovar of the Museo de Historia Natural San Marcos (USM), Nancy Refulio Rodriguez (USM), and Isidoro Sanchez Vega at Universidad Nacional de Cajamarca (CPUN). Field work and collecting were concentrated in Departamento Cajamarca, north of Ciudad Cajamarca, up to the border with Ecuador. Many remote locations were visited. After spending five days in San Ignacio, precipitated by an outbreak of shingles, the trip continued to San José de Lourdes and Bambamarca before returning to Lima. Three hundred thirty-nine numbers of grasses were obtained, including many duplicates for exchange. Tovar and Peterson have nearly completed a revision of *Agrostis* from Ecuador, Bolivia, and Peru and revised a manuscript describing *Eragrostis ancashensis*, a new species from central Peru.

Staff Activities

John Boggan reports that members of the American Gloxinia and Gesneriad Society (AGGS) toured the Department's Research Greenhouses in Suitland, Maryland on 8 April in conjunction with a flower show by the National Capital Area Chapter of AGGS, held on 8-9 April at the U.S. National Arboretum. Visitors came from as far away as Illinois, Michigan, Toronto, and Tennessee, as well as from the District of Columbia, Maryland, Delaware, Virginia, New Jersey, and New York. The following plants grown at the Department greenhouses won blue ribbons in the competitively judged flower show: *Chirita gemella* ("Best Chirita"), *Chirita speciosa* (special award for "Best New Introduction"), *Gesneria pedicellaris* ("Best Fibrous-rooted Gesneriad") and *Monopyle macrocarpa* ("Best Lesser-known Gesneriad"). The Department's plants enhanced the educational aspects of the show, which was very well attended by the general public.

Leslie Brothers entered slides in the photography part of the AGGS show and won several ribbons, including a blue ribbon (first place) for *Nematanthus* 'Tropicana' (USBRG #96-137).

Robert Faden was a judge in botany at the Virginia State Science and Engineering Fair held in Arlington, Virginia on 15 April.

Alice Tangerini participated, on 16 March, in "Technology: Futures Unlimited", an annual science career exploration day for secondary school girls held at Fairfax High School in Fairfax, Virginia. The event, sponsored by the American Association of University Women, is designed to interest girls in mathematics and science careers. She presented a workshop on botanical illustration to 45 girls including a hands-on demonstration with pen and ink.

An art exhibit, "Careers in Graphic Design and Visual Communication", held at the Community College of Baltimore County in Catonsville, Maryland from 9 March-12 April, included four illustrations by **Alice Tangerini**. She also participated in a panel discussion presented to students at the college on careers in graphic art. Tangerini and the political cartoonist for the *Baltimore Sun* had the distinction of being the two non-digital artists on the panel.

A commemorative button, designed by **Alice Tangerini**, was distributed to members of the Washington Biologists Field Club on the occasion of their 100th Anniversary on 15 February. The design was based on a logo featuring some typical plants and animals of the area around Plummer's Island in Washington, DC.

Elizabeth Zimmer served on the National Science Foundation Neon II panel at the University of California San Diego Supercomputer Center, and visited colleagues at Hitachi Genetic Systems, Caltech and the Huntington Gardens on 8-15 March.

Staff Talks

Molly Nepokroeff, **Warren Wagner**, Kenneth Sytsma and **Elizabeth Zimmer** will present a poster entitled "Biogeography, Dispersal and Evolution in Pacific *Psychotria* (Rubiaceae) Inferred From Nuclear and Chloroplast Non-Coding Sequences" at the annual Society of Systematic Biologists/Society for the Study of Evolution/American Society of Naturalists meeting in Bloomington, Indiana, 23-27 June.

As part of an ongoing discussion regarding the licensing of plant images for use on the Internet, **Rusty Russell** visited the Norcross, Georgia headquarters of Planetgarden.com in early April. While there, he spoke to a group of 30 garden writers from around the country on 6 April, and used this opportunity to impress on them the importance of the herbarium as a baseline of information about plants and its critical role in maintaining vouchers.

Plants of Washington, DC and Vicinity

March was a red-letter month for the local flora of the Washington-Baltimore area. On 21March, the *Annotated Checklist of the Vascular Plants of the Washington-Baltimore Area. Part I. Ferns, Fern Allies, Gymnosperms, and Dicotyledons* by **Stanwyn G. Shetler** and **Sylvia Stone Orli** was released. The *Annotated Checklist* is a complete revision of Frederick Hermann's *A Checklist of Plants in the Washington-Baltimore Area* (1941, 1946) for the taxonomic groups covered. *Part II* will cover the monocotyledons. It is offered as a stepping-stone to a new manual of the plants of this area. The entries include common names, synonyms, indication of whether the species occurs in the District of Columbia, Maryland and/or Virginia sectors of the area, status in the flora (native or introduced), and occasional notes. The species total is 2001, with 781 (39%) being introduced.

The day after the *Checklist* appeared, *The Washington Post* carried a front-page story on the paper "Early Plant Flowering in Spring as a Response to Global Warming in the Washington, DC, Area" by **Mones S. Abu-Asab**, **Paul M. Peterson**, **Shetler**, and **Orli** (in press). This paper, based on first-flowering records of local species maintained by Shetler and colleagues since 1970, shows that in 2000 the spring-flowering plants are blooming earlier on average than they did in 1970. The 100 species with the longest records (19-29 years) were analyzed, and they bloom 2.4 days earlier than in 1970. When the 11 species (including *Osmorhiza claytonii*, *Lonicera japonica*) that actually bloom later are removed, the remaining 89 species show an advance of 4.5 days. The majority of the 100 species bloom more than 5 days earlier and some (e.g., *Aquilegia canadensis*, *Arisaema triphyllum*) bloom much earlier on average. Washington's famed cherry blossoms, the "hook" for the *Post* story, are blooming about a week earlier today. These trends are all statistically significant. Furthermore, NOAA weather data over the same period show a small but significant warming trend in the area, based on minimum temperatures, and this trend correlates with the flowering data: the warmer the average minimum temperature, the earlier the average flowering. Of the more than 125 persons who have contributed to the database of first-flowering records, departmental botanists **Aaron Goldberg** and the late **John J. Wurdack** have been the biggest contributors. The present database of 650 native and naturalized, and more than 1900 cultivated spring-flowering species, was created by **Sylvia Stone Orli**.

More information on the "Early Flowering" newspaper article can be found at the Museum's Website <http://www.mnh.si.edu/feature.html> and the Website for the Flora of the Washington-Baltimore Area <http://www.nmnh.si.edu/botany/projects/dcflora>. At the latter site, the databases for the *Checklist* and the Spring Flowering Records can be searched. The data for the article can be found at <http://www.nmnh.si.edu/botany/projects/dcflora/floweringdata.html>.

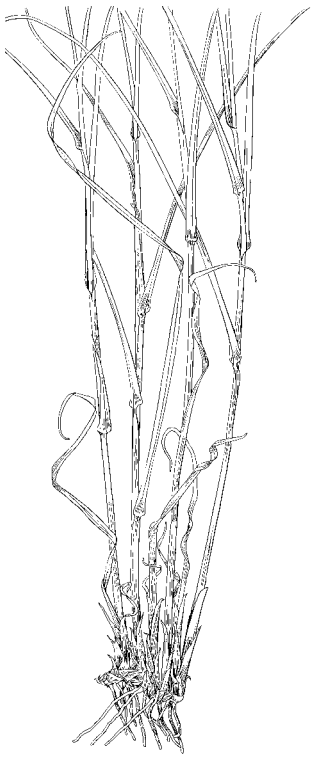
[*by Stanwyn G. Shetler*]

NMNH Hosts 2000 AIBS Meeting

The 51st Annual Meeting of the American Institute of Biological Sciences (AIBS) was held on 22 - 24 March at the National Museum of Natural History. This meeting celebrated "Biology: Challenges for the New Millennium" with some of the most preeminent scientists reviewing the major advances in organismal and integrative biology made during the last century. The meeting highlighted major discoveries in biology and attempted to capture a perspective on the coming millennium's challenges and opportunities, including the breakthroughs necessary to continue to advance biology. The opening session included an introduction and talk by Ernst Mayr, who received the 2000 AIBS Distinguished Service Award for recognition of his outstanding contribution to the advancement and integration of biological disciplines.

Other speakers included Stephen J. Gould, Daniel H. Janzen, Gene E. Likens, Lynn Margulis, Gordon Orians, Ghillean Prance, Marvalee Wake, and Edward O. Wilson. Events included plenaries, poster sessions and synthesis groups. At the synthesis groups, group leaders and meeting attendees discussed past advances and future challenges in the fields of behavior, biodiversity and conservation, development and morphology, ecosystems, evolution, integration, regulation, and systematics. In collaboration with the National Association of Biology Teachers, a "Town Meeting on Teaching Evolution" was also held, focusing on methods to teach high school and undergraduate college students about evolution and the nature of scientific inquiry.

The planning committee of the event consisted of 12 members from AIBS and the Smithsonian Institution, including **W. John Kress**. Many of the presentations will be published along with additional invited chapters in the forthcoming book, "*A New Century of Biology*," co-edited by W. John Kress and Gary Barrett. The Smithsonian Institution Press will publish the book, tentatively scheduled for publication in early 2001. For additional comments on the meeting, see "Chair with a View."



Research on the Flora of Myanmar Continues

Members of the Department once again traveled to Southeast Asia to continue our collaboration with the Myanmar Forest Department on a new list of the plants of that country. **Deborah Bell** and **Ida Lopez** concentrated their efforts on an inventory of the specimens in the only two existing herbaria in the country, at the Forest Research Institute (FRI) in Yezin and at the University of Yangon. They worked in close association with Daw Yin Yin Kyi at FRI and U Myo Khin at the university to initiate the specimen inventory. The plant inventory system developed by **Christian Tuccinardi** and **Ellen Farr** was installed on the computer systems of those herbaria and the first segment of the collections including all of the monocots and a few selected dicot families were entered into the system. These inventoried records will now be compared to our recently completed revision of the monocot checklist for Myanmar. Once the collections at the two herbaria are fully inventoried, the data will constitute the most extensive documentation ever assembled of the plants of Myanmar.

At the same time **W. John Kress** and **Michael Bordelon** continued their efforts on field collections in Myanmar by travelling to Alaungdaw Kathapa National Park and Shwesettaw Wildlife Sanctuary on the west side of the Irrawaddy River. Although the end of the dry season limited the number of taxa in flower, they found some very interesting and rarely collected species. While Deborah and Ida celebrated the famed Burmese Water Festival in Yezin, John and Michael experienced the first rains of the season as they hiked through the foothills of the Chin Mountains and Rakhine Yoma.

New to the Department's Web site is the "Botanical Exploration in Myanmar Project." This site offers a comprehensive checklist of the flowering plants of Myanmar. The checklist data include taxonomic names, distribution records, and where available, habit descriptors and common names. At the Web site you can display a checklist and distribution data for names in a family, display a list of monocot families represented in the checklist, and display a list of checklist names for a family. You can also search by state or division name to see a list of plants known to occur in that region. The current focus of the project is on the monocotyledons and will continue with the rest of the flowering plants and gymnosperms in the near future. Visit the Myanmar Project at <http://persoon.si.edu/myanmar/>.

Molecular Evolution Fellowship Awarded

Eric Roalson, graduate student at Rancho Santa Ana Botanical Garden, has been awarded a two-year Molecular Evolution Fellowship from the Smithsonian Institution. Roalson is conducting molecular, morphological and chromosomal studies of members of the genus *Carex* for his Ph.D. At the Laboratory of Molecular Systematics and in the Department, he will work with **Elizabeth Zimmer** and **Laurence Skog** on a project entitled "Floral evolution in *Gasteranthus* (Gesneriaceae): Phylogenetic relationships and ontogenetic development of floral spurs." He is expected to arrive at the Smithsonian in September 2000.

New Web Site on Conserved Plant Names

By Dan Nicolson

Over 4,400 proposals have been made to conserve and/or reject botanical names, mostly of family, genus and species names. Information on all names proposed has been compiled and is currently available on the Web at http://persoon.si.edu/codes/props/index.cfm. The site includes information on the author and place of publication of each proposal, as well as the place of publication of the committee decision, the general committee report, where cited in a synopsis of proposals, where ratified by an International Botanical Congress, and where it first appeared in a Code. The web site also allows queries.

There were a number of events that led to my building a database to account for the key events in processing all proposals to conserve and/or reject names. The first was becoming editor of *Taxon* (1979) and having to assign numbers to proposals. As a member of the editorial committee (1981) I took a particular interest in the appendices. The final influence was accumulating the literature for a history of botanical nomenclature (Ann. Missouri Bot. Gard. 78: 33-56. 1991) with an enormous annotated bibliography. This database was used to produce the synopsis of proposals on conservation/rejection for the Tokyo Congress (Taxon 42: 435-446. 1993) and the St. Louis Congress (Taxon 48: 391-406. 1999).

Thanks to the help of my assistant, Sally Eichhorn, we mined the accumulated literature to compile data on all proposals (which began in 1892). It seemed appropriate that this data (accounting for 4,432 proposals!) be made available so that anyone interested in a particular name can check to see if a proposal has ever been made. Even if a proposal is approved and the name appears in an appendix to the Code it is very difficult to track its history. If the proposal failed there is no clue. Shortly after putting it up on the Web I received an inquiry concerning a conserved name of a fossil. Not only could I tell her what she wanted to know but I also now could direct her to this tool where she reported that she herself found the needed information.

The Conservation Column

By Gary A. Krupnick

In my second report for the Plant Conservation Unit, I would like to share with you my thoughts and reflections on the Annual Meeting of the American Institute of Biological Sciences. The theme of the meeting was "Biology: Challenges for the New Millennium," and we heard talks from some of the most prominent scientists around today. A number of the speakers, including Professor Edward O. Wilson and Professor Sir Ghillean Prance, stressed the importance and the use of biological collections found in herbaria and institutions such as the Smithsonian for conservation purposes. As the continued destruction of the environment persists, the information stored in these collections will become ever more valuable than in the past. Wilson and Prance both highlighted the importance of digitizing the collections, and making these databases available on the web to all researchers. The databases should include not only the images, but also significant information on location, date, population size, and other information that will be useful in preserving and maintaining high biodiversity.

Computerized and web-based databases will be useful to the conservation biologist in many ways. A multitude of questions exists that herbaria can help answer, such as "Does a certain species still exist today where it was originally collected?" and "How has a certain plant community changed since the time of collection to the present?" It is the challenge to the botantist, systematist, conservation biologist, and field ecologist to ask the meaningful questions that can help save biodiversity. One challenge at hand today is to have a biodiversity "phone book" (in the words of Dr. Daniel H. Janzen) of all extant species and their localities. Like looking up a favorite restaurant in a new city, one would be able to look up a species and find all the wild places where it grows; or type in a desired locality and get a catalogue of all species co-existing together at that site. Unlike a phone book, a web-based database can be dynamic, in which species can be added or subtracted as natural areas gets explored, destroyed or restored.

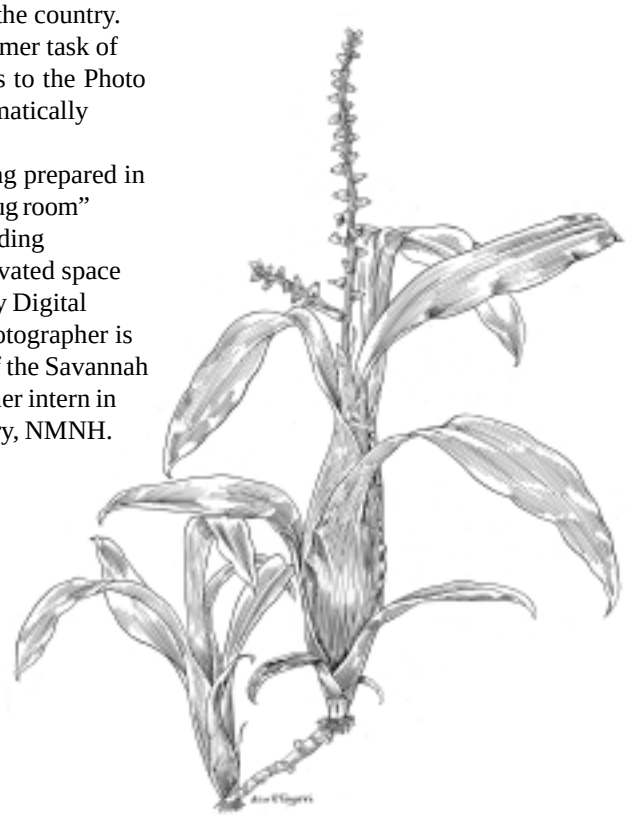
Many discoveries of new species still await us. But an abundance of meaningful data is buried in our collections. It is up to us to see that the stored information is highly accessible and widely utilized.

Department Begins Type Specimen Imaging Project

The United States National Herbarium is developing another tool to improve access to its fully inventoried collection of over 93,000 type specimens. Using state-of-the-art digital photography equipment, high-resolution images of individual type specimens have been generated. These images are being stored locally at present, but eventually will be placed on the Institution's Image Archive server. As this project unfolds, smaller versions of each image will join their data record on the Department web site. The high-resolution images may be made available to researchers upon special request.

When the initial test phase, using a number of smaller families, is completed, work will commence on the families for which staff expertise exists. This is expected to be done within 12 months (excluding the entire Poaceae and Asteraceae type collections). The target for completion of the entire type collection is 5 years. As work through the type collection proceeds, specimens will also be digitized prior to being loaned out of the country. This process replaces the former task of transporting these specimens to the Photo Services Laboratory and dramatically reduces the turnaround time.

A dedicated space is being prepared in Room W427, formerly the "rug room" under the domain of the Building Manager's Office. This renovated space will be designated the Botany Digital Laboratory. Our contract photographer is **Susan Hunter**, a graduate of the Savannah School of Design, and a former intern in the Photo Services Laboratory, NMNH.



Dorr

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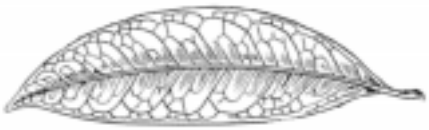
inflorescence-bracts with their strong hands and vigorously open them up like a farmer doing a corncob; the lemur then makes a face-first meal of the copious nectar inside the flowers. Lemur visitation is only one of the mysterious syndromes in the Madagascar flora. Another is the foot-long nectary spur of the Christmas Star orchid *Angraecum sesquipedale*, a species which Charles Darwin correctly predicted would be pollinated by a then-unknown moth with a foot-long proboscis (subsequently identified as the sphinx moth *Xanthopan morgani* subsp. *praedicta*). Much of the Madagascar flora is now under threat of major dismantling, and significant portions of it have been impacted to the point of obsolescence for decades by the requirements of agriculture and economic development. Fortunately, theme parks are unheard of there.

Dorr's treatise of collectors took him ten years to write, and initially was based on his three-year period of living and collecting plants in Madagascar (1983-1986) while an assistant curator of the Missouri Botanical Garden, charged with establishing a program of research and exploration based in Antananarivo. Successfully fulfilling the mission, he went on to an appointment as a research assistant at the New York Botanical Garden (1988-1991) before arriving in the Department of Botany in the National Museum of Natural History, Smithsonian Institution in late 1991.

Too young to be embalmed by the creative sclerosis that sometimes mummifies other taxonomists, Dorr soon became interested, during and after Madagascar, in another subject of magnitude, a study of the order Malvales. Recognized in general by the mostly stellate or lepidote indumentum and the anatomical capacity to produce mucilage, relationships between the five core families (out of eight in the order) are being clarified and delimited anew through his research. With the possible exception of the Elaeocarpaceae, the major families all contain elements that are recognizable to the general public: Malvaceae (cotton, okra, Chinese hibiscus); Sterculiaceae (cacao); Tiliaceae (jute, linden tree); and Bombacaceae (baobab, durian, balsa wood). He had to lectotypify the well-known Linnean genus of the cacao tree, *Theobroma*, in 1993, but by and large, in order to pin down the taxonomy, nomenclature and systematics of the components of the order as a whole, Dorr frequently finds himself delving into the relations of obscurely understood tropical taxa variously ascribed to the Sterculiaceae (such as *Aethiocarpa*, *Humbertiella*, *Nephropetalum*), the Tiliaceae (such as *Pentaplaris*, *Riddelia*), and the Malvaceae (*Nesogordonia*). Convincing evidence from molecular botany and the expression of clades within the expanded Malvaceae are also being taken into consideration.

Concurrent with his efforts to advance our understanding of the Malvales, he is preparing a treatment of the flora of a very interesting 21 square kilometer area of the northern Andes Mountains, namely the Guaramacal National Park, Venezuela, on the slopes of the Sierra Nevada proper which face the llanos. Supporting around 500 genera and 1,200 species of vascular plants, already some 35 new species have been described from the area. In this enterprise, Dorr's principal collaborator is Basil Stergios of UNELLEZ, Guanare, Venezuela, with whom he edited the recent festschrift in honor of J.J. Wurdack in the journal *BioLlania* (1997). A measure of Dorr's versatility is expressed by his interest in the applications of computer technology in data processing and making scientific information available to a wider readership. To this end he was fortuitously instrumental, in 1996, in posting to the departmental world-wide web home page such items as the "Catalog of Botanical Illustrations" (with E.R. Farr and A.R. Tangerini) and the "Wood Collection, Department of Botany", and contributed a treatment of three ericaceous genera to electronic "Neotropical Blueberries" (1998) by J.L. Luteyn of the New York Botanical Garden.

In the face of ever-diminishing natural habitats and biodiversity around the world, including some in his Guaramacal, Venezuelan study area where pristine areas are encountered less frequently every year, Dorr believes that systematic investigations of plants are, and should be, the basis of all other studies, and should be encouraged among alpha and evolutionary disciplines alike. Perhaps it is time to heed his perceptorial injunction for the new millennium.



Upcoming Symposia

A symposium on "The Computational Challenges of Green Plant Phylogeny" will be held 2-3 June at the University of Maryland - College Park, sponsored by the Green Plant Phylogeny Research Coordination (Deep Green) Group and University of Maryland Computing. Research in green plant phylogeny has advanced greatly in recent years. Following the 1999 International Botanical Congress in St. Louis, Missouri, several large datasets relevant to green plant phylogeny have been published, and several biological questions have emerged as critical to an understanding of the evolution of green plants. Speakers will include Pam Soltis (Washington State University), Mike Sanderson (University of California, Davis), Tandy Warnow (University of Pennsylvania), John Huelsenbeck (University of Rochester), and Sean Graham (University of Alberta). For further information contact **Elizabeth Zimmer** (Steering Committee member of Deep Green) or visit <http://www.life.umd.edu/labs/delwiche/DeepGreen.html>.

Scientists working on Colombian biodiversity will present talks in a mini-symposium sponsored by the Mellon Smithsonian Program and organized by **Elizabeth Zimmer**, Joe Tohme (Centro Internacional de Agricultura Tropicale) and Cristian Samper (Instituto Humboldt). The talks will be given on 19 June. On 20 June the visiting scientists will meet with members of their relevant departments to discuss and draft possible collaborative projects and proposals. More information on this symposium will be posted museum-wide in early May.

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are at the forefront of our goals for the next century. Investigations in developmental biology linked with the disciplines of evolution, ecology and systematics will be a major priority in the near future. Perhaps most importantly for scientists in museums and botanical gardens was the universal call for greater accessibility to natural history collections for solving global biodiversity and conservation challenges. Our specimens contain the critical and necessary information needed for identifying centers of biological diversity for conservation. As stated by Wilson, "Biodiversity is a Linnaean enterprise" and the development of accurate and usable taxonomic classifications must be a priority for the world's centers of natural history research.

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Art by Alice Tangerini

Pentaplaris huaoranica Dorr & C. Bayer and *P. davidsmithii* Dorr & C. Bayer

Until recently, *Pentaplaris* was known from a single collection made in Costa Rica. A new emphasis on collecting all trees encountered in forest plots of fixed dimensions led to the discovery of two new species in South America; *P. huaoranica* Dorr & C. Bayer (figs. A, B) and *P. davidsmithii* Dorr & C. Bayer (figs. C-E). All three species are very large trees (up to 50 m tall) and probably would not have been collected casually. *Pentaplaris* was placed in Tiliaceae, but morphological, palynological, and molecular evidence suggest that it is more closely related to what had traditionally been considered Malvaceae and Bombacaceae. This was one of four plates published in a synopsis of the genus (*Brittonia* 51: 134-148. 1999).

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