

The Plant Press



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Botany Profile

Mt. Sanqingshan, a Botanical Treasure

By Jun Wen

In mid July, I visited the Mt. Sanqingshan Preserve in northeastern Jiangxi province of China to conduct an international workshop on Asian-North American disjunct plants. During the workshop, we had opportunities to botanize with the workshop participants and the staff members of the preserve. I was highly impressed with the plant diversity, the richness of eastern Asian-eastern North American disjunct plants, and its unique and diverse granite hill forest physiognomy in Sanqingshan.

Sanqingshan or Sanqing Mountain is famous for its Taoist culture, temples and other relics. In Chinese Sanqing literally means "three distincts," because Sanqingshan has three main peaks with the highest Yujing peak of nearly 1,819 meters above the sea level. Sanqingshan ranges in elevation between 200 and 1,819.9 meters, covering a protected area of 229.5 km² with the additional buffer zone of 168.5 km². Recently Sanqingshan was nominated to be one of the World's Natural Heritage sites and it is currently under the evaluation by IUCN.

Remarkably there are 68 (out of 120 in total in Asia) plant genera found in Sanqingshan that have an eastern Asian-North American disjunct distribution. Examples of these genera include *Acorus*, *Campsis*, *Liquidambar*, *Liriodendron*, *Magnolia*, *Menispermum*, *Mitchella*, *Penthorum*, *Phryma*, *Sassafras*, *Saururus*, *Nelumbo*, *Zizania*, *Illicium*, *Torreya*, *Stewartia*, *Hydrangea*, *Tsuga*, and *Pseudotsuga*. Sanqingshan has one of the best developed *Pseudotsuga gaussenii* forests in eastern Asia. Here this type of

forest covers an area of 533 hectares. The North American congener of *Pseudotsuga* is in western North America, known as the Douglas fir. The genus is peculiarly disjunct in two important refugia, one in eastern Asia and the other in western North America.

Of the 68 Asian-North American disjunct genera, 51 are woody, accounting for 75% of this distribution pattern. Most of these genera are in the evergreen broad-leaved forest, evergreen and deciduous broad-leaved mixed forest. The subtropical elements of the East Asian-North American disjunct plants are abundant in the valley evergreen broad-leaved forest in Sanqingshan, such as *Halesia*, *Gymnocladus*, *Liriodendron*, *Torreya*, *Stewartia*, *Lyonia*, and *Campsis*. And the more temperate elements such as *Pseudotsuga*, *Tsuga*, *Zizania*, *Menispermum*, *Phryma*, *Panax*, *Wisteria*, *Pachysandra*, and *Cladrastis* are more concentrated in the coniferous and broad-leaved mixed forests with the elevations more than 1,000 meters.

Mt. Sanqingshan is rich in rare and endangered species. About 2,373 higher plant species and 401 vertebrate species have been recorded in this mountain, of which 45 species are listed in the IUCN Red List, 146 species are listed in the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES), 144 species are listed in the China Species Red List, and 79 species are listed as the state specially protected wild species. Examples of rare plant species include *Ginkgo biloba*, *Pseudotsuga gaussenii*, *Disanthus*

cercidifolius var. *longipes*, *Liriodendron chinense*, *Magnolia cylindrica*, *Cyclocarya paliurus*, and *Pseudotaxus chienii*.

Sanqingshan well preserves the subtropical low altitude humid evergreen broad-leaved forest from 200 to 1,000 meters. The species of this type of forest include: *Parakmeria lotungensis*, *Elaeocarpus decipiens*, *Sloanea sinensis*, *Alniphyllum fortunei*, *Daphniphyllum oldhami*, *Sycopsis sinensis*, *Cyclobalanopsis glauca*, *Cyclobalanopsis gracilis*, *Castanopsis sclerophylla*, *Castanopsis eyrei*, *Castanopsis tibetana*, *Schima superba*, *Machilus thunbergii*, *Machilus chinensis*, *Cinnamomum subavenium*, and *Manglietia yuyuanensis*.

Vertical zonations of vegetation are well developed in Sanqingshan. In general, from low to high elevation, the following types of vegetation can be seen: low altitude evergreen broad-leaved forest of zonal vegetation (≤ 600 m), warm temperate coniferous and broad-leaved mixed forest (600-800 m), evergreen and deciduous mixed broad-leaved forest (800-1,100 m), temperate coniferous and broad-leaved mixed forest (1,100-1,600 m), warm temperate coniferous forest (1,500-1,700 m), evergreen coppice forest (1,400-1,700 m), evergreen broad-leaved shrublands, deciduous broad-leaved shrublands, and alpine bamboo thicket ($\geq 1,600$ m). Sanqingshan has not been affected by the Quaternary glaciations and many Asian-North American disjunct plants have been preserved in this area. The different vegetation types in diverse habitats have

Continued on page 12

Walter Adey traveled to Shepherdstown, West Virginia (8/28 – 8/30) to develop a research project at the Freshwater Institute; and to Kalamazoo, Michigan, and Ocala, Florida (9/24 – 9/28) to give a presentation at Western Michigan University and to discuss project support with HydroMentia.

Laurence Dorr traveled to London, England (8/6 – 8/21) to conduct research at the Royal Botanic Gardens, Kew; and to Bronx, New York (9/19 – 9/21) to use the library to continue his work on the next volume of *Taxonomic Literature* at the New York Botanical Garden.

Robert Faden traveled to Chicago, Illinois (7/7 – 7/12) to present a talk at the Botany 2007 meeting; and to Thailand (8/31 – 9/30) to collect Commelinaceae for a Flora of Thailand treatment of the family.

Maria Faust traveled to Providence, Rhode Island (8/5 – 8/10) to present a talk at the 13th Phycological Society of America and International Society of Protistologists Meetings.

Vicki Funk traveled to Chicago, Illinois (7/9 – 7/11) to preside over the American Society of Plant Taxonomists council and business meetings as President and to present a talk at the Botany 2007 meeting; and to western South Africa,

Namibia, and Botswana (8/1 – 8/31) to collect Asteraceae specimens.

W. John Kress traveled to Chicago, Illinois (7/9 – 7/11) to present a talk at the Botany 2007 meeting; to Morelia, Mexico (7/14 – 7/21) with **Vinita Gowda** to present talks and posters at the annual meeting of the Association for Tropical Biology and Conservation; to Taipei, Taiwan (9/15 – 9/24) to present a talk at the 2nd International Barcode of Life Conference.

Gary Krupnick traveled to Morelia, Mexico (7/15 – 7/19) to present a talk at the annual meeting of the Association for Tropical Biology and Conservation.

Mark Littler, Diane Littler, and Barrett Brooks traveled to the Pacific side of Panama (9/1 – 9/16) to continue their project on the marine plants of the Pacific and Caribbean Panama.

Ida Lopez, Ling Zhang and intern **Maribeth Kniffin** traveled to Manhattan, New York (6/13 – 6/16) to collect tree specimens of Central Park for the Instant Identification Project; and to Morelia, Mexico (7/14 – 7/21) to attend the annual meeting of the Association for Tropical Biology and Conservation.

Dan Nicolson traveled to Beijing, Kunming, and Chengdu, China (8/7 – 8/26) to give lectures on the International Code of Botanical Nomenclature.

Paul Peterson traveled to Chicago, Illinois (7/7 – 7/12) to present a talk at the Botany 2007 meeting; throughout eastern United States (8/5 – 8/16) to collect specimens; and throughout Mexico (9/19 – 10/25) for field work.

Robert Soreng traveled to Yunnan and Sichuan, China (7/15 – 7/20) for a field expedition with Jun Wen; and to Las Cruces, New Mexico (9/13) to give a talk at New Mexico State University.

Alice Tangerini traveled to Bozeman, Montana (7/15 – 7/26) to attend the Guild of Natural Science Illustrators Conference and Annual Meeting.

Alain Touwaide and Emanuela Ap-

petiti traveled to Kuala Lumpur, Malaysia (7/12 – 7/29) as invited speakers to the 3rd International Congress on Traditional Medicine & Materia Medica; to Madrid, Spain (9/11 – 9/12) to conduct research at the National Library; to Granada, Spain (9/17 – 9/19) to delivered two papers at the 3rd Workshop on Natural Sciences in Andalusia at the University of Granada; and to Seville, Spain (9/19 – 9/22) to attend the 38th International Conference on the History of Pharmacy.

Warren Wagner traveled to Chicago, Illinois (7/6 – 7/11) to present a talk at the Botany 2007 meeting and to attend the council meetings of both the International Association for Plant Taxonomy and the American Society of Plant Taxonomists; and to Oahu and Kauai, Hawaii (8/7 – 8/26) to work on the Flora of the Marquesas Islands project at the Bishop Museum and the National Tropical Botanical Garden.

Jun Wen traveled to Chicago, Illinois (7/7 – 7/11) to present a talk at the Botany 2007 meeting; to Jiangxi, China (7/12 – 7/17) to conduct an international workshop on Asian-North American disjunct plants; to Yunnan and Sichuan, China (7/18 – 8/23) with **Katherine Rankin** for a field expedition; to the Great Lakes region (9/1 – 9/7) for field work; to Yale University (9/17) to attend a graduate committee meeting; and to the southeastern United States (9/25 – 9/29) for field work.

Kenneth Wurdack traveled to Bronx, New York (6/21 – 6/23) to conduct research at the herbarium and library of the New York Botanical Garden; to Malaysia (8/31 – 9/16) with **Benjamin Van Ee** for field work; and throughout the Netherlands (9/24 – 10/6) for meetings and herbarium work.

Elizabeth Zimmer traveled to Chicago, Illinois (7/8 – 7/11) to present a poster at the Botany 2007 meeting.



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Chair of Botany

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Visitors

Ki-Oug Yoo, Kangwon National University, South Korea; Coryloideae and Vitaceae (12/12/06-12/11/07).

Lei Xie, Chinese Academy of Sciences; *Clematis* (Ranunculaceae), *Circaea* and

Fuchsia (Onagraceae) (1/1/07-12/31/08).

Tieyao Tu, Kunming Institute of Botany, China; *Nolana* (Solanaceae) (1/18/07-1/17/08).

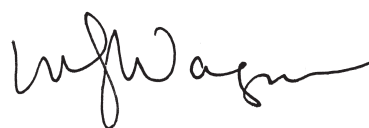
On the Frontline of Discovery

The discovery, description and understanding of the Earth's plant species remain top priorities for scientists around the world as has historically been the case. The scientists in the Department of Botany provide authoritative information that is the foundation for an understanding of the natural world and humanity's place in it. Our botanists conduct world-class, integrative research, the results of which are shared with the scientific community and society in a wide variety of venues, which can lead to better and sustainable conservation programs around the world. The basis for this research is the long history of sustained collection and study of plants in the field.

Currently, our botanists work in over 25 different countries around the world, in all parts of the tropics (e.g., Argentina, Bolivia, Brazil, China, Cameroon, Colombia, Ecuador, Guiana, Kenya, Madagascar, Thailand, Venezuela, and the islands of the Caribbean Sea and the Pacific Ocean). Our work entails the discovery, documentation and description of plants as well as experimental work on placing each of these plants in the Tree of Life. Smithsonian botanists are leading programs to discover and inventory plant life as well as assess conservation plans for establishing nature sanctuaries and reserves. Training local staff in scientific and conservation techniques and methods is one of the most vital aspects of these research programs of discovery.

As you can see in this issue of the *Plant Press* we remain very active in many areas of the world. There are reports highlighting recent trips to China by Jun Wen and Rob Soreng, Thailand by Robert Faden, South Africa by Vicki Funk, and Panama by Mark Littler, Diane Littler, and Barrett Brooks.

The ability to serve society in these ways rests on the careful research that has been conducted at the Museum for more than 100 years. Smithsonian Botany is a leader in biodiversity research with an outstanding scientific staff and efficient infrastructure to guarantee success. We have successfully demonstrated, for example in our programs on the Biodiversity of the Guianas and Pacific Islands, the integration of botanical collections, research, and local conservation efforts. But time is of the essence. As habitats are degraded at a more rapid rate each year our scientists must also increase their global efforts to explore the remaining pristine and partially intact habitats as soon as possible. To this end the Department must find ways to greatly expand the resources available from both public and private sectors to boost our funding and find new ways to maintain and enhance our long history of sustained collection and study of plants in the field.



Chair
With
A
View

Warren
L.
Wagner



Ling Zhang, Xishuangbanna Tropical Botanic Garden, Chinese Academy of Sciences; Instant Identification System (1/22/07-1/21/08).

Hongli Tian, Beijing Institute of Botany, China; *Nelumbo* (Nelumbonaceae) (4/25-10/24).

Rodrigo Duno de Stefano, Centro de Investigación Científica de Yucatán, Mexico; Leguminosae in the Yucatan Peninsula Biotic Province (5/3-7/7).

Yunjuan Zuo, Beijing Institute of Botany, China; *Panax* (Araliaceae) (5/7/07-5/6/08).

Maribeth Kniffin, Smith College; Botanical art (5/29-8/3).

Trang Nguyen, Virginia Polytechnic Institute; Botany of the United States Exploring Expedition (5/29-8/10).

Charles Zartman, Instituto Nacional de Pesquisas da Amazonia, Brazil; Herbarium and collaboration (6/4-7/9).

Mauricio Diazgranados, University of Missouri-St. Louis; *Espeletiinae* (Compositae) (6/4-8/10).

Charlotte Williams, Brigham Young University; Botany of the United States Exploring Expedition (6/11-8/24).

Xavier Cornejo, Universidad de Guayaquil, Ecuador; Ecuadorian Sabiaceae (7/2-7/3).

Grant Godden, Michigan State University; *Poliomintha* (Lamiaceae) and related genera (7/9-7/13).

Amanda Gibson, Amherst College; Caryophyllaceae (7/10).

Joao Paulo Condack, New York Botanical Garden; Brazilian Ferns (7/16-7/19).

Alejandra Vasco-Gutierrez, New York Botanical Garden; *Elaphoglossum* complex (7/16-7/19).

Neil Snow, University of Northern Colorado; *Leptochloa* (Poaceae) (7/16-8/3).

Ximena Londono Pava, Instituto Val-lecaucano de Investigaciones Científicas,

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Staff Research & Activities

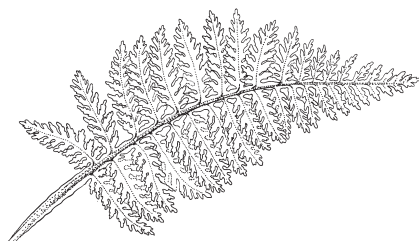
Members of the Instant Identification System (IIS) Project demonstrated the Plant Identifier at Rock Creek Park Day on 29 September. Demonstrating the device were **Vinita Gowda**, **W. John Kress**, **Ida Lopez**, **Ling Zhang**, Matt Smith and Daozheng Chen (University of Maryland).

During three weeks in August, **Dan Nicolson**, John McNeill (Royal Botanic Garden, Edinburgh), Fred Barrie (Field Museum), and Nicholas Turland (Missouri Botanical Garden) traveled throughout China on a lecture tour. Lectures about the International Code of Botanical Nomenclature were presented in Beijing, Kunming, and Chengdu. The Kunming lecture was very popular, with over 90 students in attendance. In addition, the group was given two three- to four-day tours, including a visit to the Gaoligongshan range (bordering Myanmar and crossing the Mekong and the Salween rivers). The group also botanized on the east and west sides of Mt. Emei, in Sichuan province of Western China.

Alice Tangerini attended the Guild of Natural Science Illustrators (GNSI) Conference and Annual Meeting held at Montana State University in Bozeman, Montana on 15-21 July. A Digital Roundtable discussion led by a panel of five experts in graphic software provided a forum for answering questions concerning digital graphics. This provided Tangerini with the opportunity to pose questions on her process of making the series of drawings, maps and diagrams for the Cuatrecasas manuscript into a publication ready format. The GNSI Annual Exhibit on display at Cheever Hall on the MSU campus had one of Tangerini's illustrations, *Ixora uapoensis*, on display. The Exhibit received good reviews in local newspapers. Coinciding with the GNSI Conference was the AMI (Association of Medical Illustrators) Annual Meeting and Tangerini was invited to present a demonstration and display of her work at their "Techniques Showcase."

Alain Touwaide and **Emanuela Appetiti** traveled to Malaysia, as invited speakers

to the 3rd International Congress on Traditional Medicine & Materia Medica, held in Kuala Lumpur on 17-20 July. Touwaide presented the paper "A Forgotten Treasure from Ancient Documents", while Appetiti's paper was titled "The Basis of Therapeutics among Australian Aborigines". At the same conference, they jointly presented the poster "Cinnamon in Classical Antiquity". They spent the second week conducting ethnobotanical research on the east coast, visiting local communities.



New Faces

Danica Harbaugh began a new post-doctoral position with **Warren Wagner** this autumn. Harbaugh comes to the Smithsonian Institution after a long stint in the Integrative Biology program at the University of California at Berkeley, where in 2000 she received a B.A., and in 2007 a Ph.D. under the advice of Bruce Baldwin and Thomas Carlson. Throughout her time at Berkeley, her research has included work on the phylogenetics, systematics, ethnobotany and conservation of several Pacific Island plant groups, including algae, mosses and angiosperms. Her doctoral dissertation research focused on reconstructing the phylogeny and biogeography of the genus *Santalum* (Santalaceae), which includes the commercially valuable sandalwoods. Harbaugh will work primarily on a project with Wagner, Rob Fleischer, Helen James, and previous post-doc Diana Percy to investigate the phylogeography of the widespread and ecosystem-dominant Hawaiian trees of the genus *Metrosideros*. She will also continue with her work on sandalwoods by completing a taxonomic revision of the genus, as well as examining the phylogeography of the rare Hawaiian sandalwoods using a combination of microsatellites and low-copy nuclear gene sequences. And lastly, Harbaugh will collaborate with Wagner and **Elizabeth Zimmer** on another project that will examine the biogeography of the genus *Melicope* (Rutaceae) in the Pacific.

ATS Energy Project Receives Funding

Walter Adey has received an award of \$447,000 from the Lewis Foundation of Cleveland to fund his Algal Turf Scrubbing (ATS) Energy Project. In collaboration with researchers at the Universities of Maryland, Western Michigan and Arkansas, as well as the Freshwater Institute of the Conservation Fund and the engineering firm HydroMentia, Adey is seeking to employ the biotechnology Algal Turf Scrubbing to clean nutrients from major rivers and lakes while producing an energy-rich algal biomass that can be converted to biodiesel and butanol.

Marine algal turfs are highly diverse red algal and diatom-dominated benthic sub-ecosystems that develop high levels of primary productivity partly because of the physical driving forces of wave action. Fresh water algal turfs also occur in the riffles of streams and the wave zones of lakes. Diatoms are important here as well, but the red algae of marine waters are replaced by many species of green algae. Working with Adey, **Sue Lutz** has spent years working on ATS systems and has helped **Alice Tangerini** to produce elegant drawings showing the rain-forest like structure of these algal turf communities.

Adey developed ATS during the late 1970s while working on the role of algal turfs in coral reef metabolism. The conversion of algal turf ecosystems to the technology of algal turf scrubbing, a biomimicry of the wild ecosystem, occurred when the wild biophysical environment was provided in an engineered format, but with natural grazers missing. Human operators provided the necessary grazing in a managed harvest. This step produced controlled ecosystems that are both productive and bio-diverse; the yearly mean rate of capture by ATS of solar energy in central latitudes of the US is 35g (dry wgt)/m²/day, which is five to 10 times that of typical field agriculture. The technology was first used to control water quality in the Marine Ecosystems Exhibit that occupied the eastern end of the "Whale Hall" in the National Museum of Natural History from 1980 until 1998. Later Adey and his wife Karen, (former Deputy Director of Smithsonian Productions until 1998) extended use of ATS to sewage treatment and large scale aquaculture.

Beginning in 2001, the Florida engineering firm HydroMentia, working with several Florida State water management districts, developed large scale ATS systems for cleaning nutrients from polluted streams flowing into Lake Okeechobee; more recently a 1,440 acre, three billion gallon per day system was designed and partially funded to clean non-point source farm-derived nutrients from the Suwannee River in Florida.

Adey's team of ecologists, chemists and engineers is seeking to expand the technology as a system to clean the Chesapeake Bay and Mississippi Watersheds. Using the waste nutrients of polluted rivers, ATS captures solar energy at higher rates than that of agricultural systems; conversion of the ATS algal bioproduct to a biodiesel has already been demonstrated by MRI, the parent of the National Renewable Energy Laboratory (NREL). Now the team plans to demonstrate conversion of the algae's carbohydrates to butanol. Using the understanding of decades of basic research in natural history, it may well be possible to begin to address some of the most difficult problems facing human society.

Visitors

Continued from page 3

Colombia; *Guadua* (Poaceae) (7/16-8/18).

Melissa Luckow, Cornell University; *Leguminosa* (7/16/07-6/30/08).

Taylor Quedensley, University of Texas; Compositae (7/23-8/9).

Christopher Hardy, Millersville University; Commelinaceae (7/25-7/26).

Margherita Maccaferri, University of Bologna, Italy; *Historia Plantarum* Collection (7/30-9/10).

Rachel Jabailey, University of Wisconsin-Madison; *Puya* (Bromeliaceae) (8/6-8/10).

Fiorella Mazine, Sao Paulo State University, Brazil; South American Myrtaceae, especially *Eugenia* (8/6-8/31).

Michael Nee and **Daniel Villarroel**, New York Botanical Garden; Solanaceae (8/8-8/10).

Bretta King and **Erica Van Auken**, Earthwatch Institute; Pacific Island ethno-

botany (8/13-8/16).

Claudia Lewis, and **Andrew, Carol** and **Christopher Woo**, Earthwatch Institute; Pacific Island ethnobotany (8/13-8/17).

Brian Boom and **James Miller**, New York Botanical Garden; Conservation of Caribbean plant species (8/16).

Candida D'Avanzo and **Janet Hayes**, Earthwatch Institute; Pacific Island ethnobotany (8/20-8/24).

Margareth Ferreira de Sales, Universidade Federal Rural de Pernambuco, Brazil; *Croton* sect. *Geisleria* (Euphorbiaceae) (8/27-8/30).

Diane Pavék, United States Department of Agriculture; Rock Creek Park invasives (8/28).

Cristin Walters, Chicago Botanic Garden; Rock Creek Park invasives (8/28).

Monica Ponce, Instituto de Botanica Darwinion, Argentina; Ferns (8/28-9/30).

Shan-jye Moore, National Taiwan Normal University, Taipei; *Microlepidia* (9/11).

Beth Colket, NatureServe, Idaho Conservation Data Center; *Botrychium* (9/13).

Larissa Vasilyeva, Russian Academy of Sciences, Russia; Botany Library (9/13).

Valerie Morrison, **David Peck** and **Joshua Staller**; Earthwatch Institute; Pacific Islands ethnobotany (9/17-9/21).

Tracey Parker, Independent researcher, Managua, Nicaragua; Central American plants (9/18-10/2).

Carmen Ulloa, Missouri Botanic Garden; Andean Melastomataceae (9/19-9/20).

David Frodin, Royal Botanic Gardens, Kew; Araliaceae (9/22-9/25).

Mary Barr, Earthwatch Institute; Pacific Island ethnobotany (9/24-9/28).

Theodore Fleming, University of Miami; Pollination systems (9/24-11/30).

Mirella Bertini, **Nancy Nodora**, **Theresa Van Camp**, **Helen Waterbury**, and **Robert Wheeler**, Earthwatch Institute; Pacific Island ethnobotany (9/24-9/28).

John Clark, University of Alabama; Gesneriaceae (9/30-10/7).

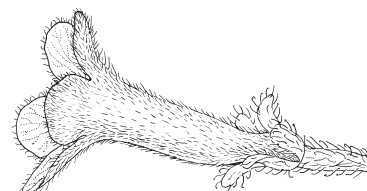
Cuatrecasas Travel Award

The Cuatrecasas Travel Award (CTA) is an annual competition offered by the Department, which will usually result in one to two awards, each not exceeding \$3,000. The award is to support work in the spirit of the research of the late Dr. José Cuatrecasas, a long time associate of the U.S. National Herbarium. Priority is given to scientists from Latin America or from elsewhere who work on tropical plants. Funds are to be used to study specimens housed in the U.S. National Herbarium.

This year, the CTA Committee (**Pedro Acevedo**, **Laurence Dorr**, and **Vicki Funk**) selected five proposals to fund. Fortunately, the Acting Secretary of the Smithsonian, Cristián Samper, and the Acting Director of the National Museum of Natural History, Paul Risser, will provide extra money, to bring a total of seven applicants to the US National Herbarium:

- **Mauricio Diazgranados**, "Ecology and systematics of *Espeliopsis* (Compositae)."
- **Mónica Ponce**, "A revision of the Neotropical *Cheilanthes* (Pteridaceae)."
- **Rachel Schmidt Jabaily**, "Systematic relationships in *Puya* (Bromeliaceae), an herbarium visit to select localities for a collecting expedition."
- **Maria Beatriz Rossi Caruzo**, "Systematics and biogeography of *Croton* section *Cleodora*."
- **Jesus Rodrigo Botina-Papamija**, "Taxonomy of Smilacaceae in Andean region of northern South America."
- **Maria Camila Gómez G.** and **Camilo J. Londoño A.**, "Biological information system for the flora of the Colombian Paramos."

These awards will bring in four colleagues from Colombia, one from Argentina, and one from Brazil. These trips will help build institutional collaboration and advance botanical systematics.



The 2008 Smithsonian Botanical Symposium, 25-26 April, to Explore Coevolution

The Departments of Botany and Entomology will convene the 2008 Smithsonian Botanical Symposium, “**Partners in Evolution: Interactions, Adaptations, and Speciation,**” to be held at the National Museum of Natural History in Washington, D.C., on 25 – 26 April 2008.

Plants and animals have ecologically interacted for hundreds of millions of years. These interactions have resulted in adaptations and specializations in both the plants and the animals. In some cases these adaptations have resulted in the coevolution of the two lineages. The 2008 Smithsonian Botanical Symposium will address the various ecological interactions, evolutionary adaptations, and co-radiations of plants and animals in habitats across the planet and explore the processes of coevolution.

The Symposium aims to highlight the new hall of coevolution, entitled “Partners in Evolution – Butterflies and Plants,” which will open at the National Museum of Natural History in February of 2008. This new permanent exhibit will give visitors the opportunity to walk among living tropical and temperate butterflies and plants, and learn how they have co-evolved over millions of years generating the biological diversity we see today. Research of Smithsonian scientists dealing with the topic of coevolution will also be featured.

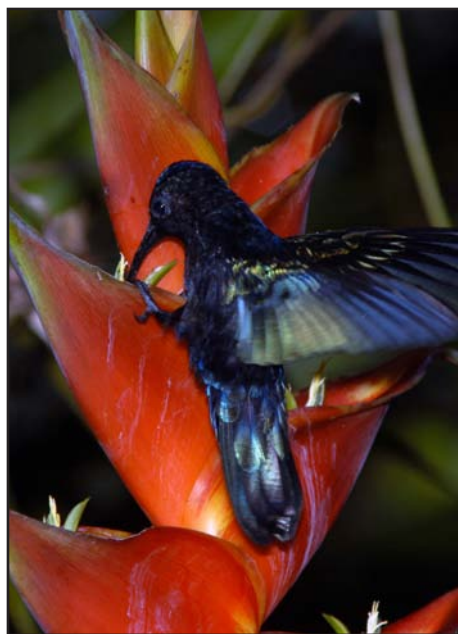
In addition, the seventh José Cuatrecasas Medal in Tropical Botany will be awarded at the Symposium. This prestigious award is presented annually to an international scholar who has contributed significantly to advancing the field of tropical botany. The award is named in honor of Dr. José Cuatrecasas,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

Sponsors of the Symposium are the Departments of Botany and Entomology, the Office of the Associate Director

for Research and Collections, the United States Botanic Garden, the National Tropical Botanical Garden, and the Cuatrecasas Family Foundation.

Registration and additional information about the 2008

Smithsonian Botanical Symposium will appear soon at <http://www.nmnh.si.edu/botany/>. You may also call 202-633-0920 or email sbs@si.edu for more information.



The Purple-throated Carib (*Eulampis jugularis*) pollinating *Heliconia caribaea*, its primary host plant in the Eastern Caribbean. (Photo by W.J. Kress)

Classification of Onagraceae is Revised

Warren L. Wagner, along with Missouri Botanical Garden collaborators Peter C. Hoch, and Peter H. Raven, recently published “Revised Classification of the Onagraceae” in *Systematic Botany Monographs* (83: 1-240; 2007). The book represents the culmination of many years work in the family, especially by Peter Raven, his students and collaborators. It is the first comprehensive classification of the family

since 1893 and the first complete listing of recognized taxa since 1832. Moreover, this synopsis is the first to review and integrate significant diagnostic characters from the extensive literature on the family for all taxa above the species level, and summarizes information on chromosome numbers, breeding systems and pollinators, and geographic and ecological distributions for each species group formally recognized.

Recent molecular phylogenetic analyses in the plant family Onagraceae, carried out primarily at the Smithsonian Institution by post-doctoral fellow **Rachel Levin** and others, provided critical evidence that underlies this revision of the family classification. Wagner, Hoch and Raven developed this recent monograph over the past several years by bringing together the new molecular phylogeny with the broad array of morphological characters known in the family, and expressing this in the context of the nomenclatural history of Onagraceae. The new publication also provides a species level synopsis of the family, incorporating all nomenclatural changes and combinations but not full species-level synonymy. It presents descriptions of all taxa recognized for the first time, as well as tribes, genera, sections, subsections, and series.

The new classification recognizes 22 genera in the Onagraceae, subdivided into two subfamilies, Ludwigioideae (only *Ludwigia*) and Onagroideae (the other genera), and the latter into six tribes, two with only one genus each, three with two genera each, and one (tribe Onagreae) with 13 genera. The authors list recognized taxa for each group. Many changes involve the tribe Onagreae, from which the authors segregate *Gongylocarpus* as its own tribe, sister to tribes Epilobieae and Onagreae, and within which they propose changes in the delimitation of *Camissonia* and *Oenothera*. *Camissonia* as currently defined is broadly paraphyletic, and the new classification recognizes nine generic lineages (*Camissonia*, *Camissoniopsis*, *Chylismia*, *Chylismiella*, *Eremothera*, *Eulobus*, *Holmgrenia*, *Taraxia*, and *Tetrapteron*), which in part form a grade at the base of *Oenothera*. Each of these lineages is well-supported by morphological and molecular data. In contrast, molecular and morphological data both suggest the need to broaden the delimitation of *Oenothera* to include *Calylophus*, *Gaura*, and *Steno-*

siphon. This redefined *Oenothera*, strongly supported by molecular data, is marked by at least two morphological synapomorphies: the presence of an indusium on the style, and a lobed or peltate stigma.

This publication represents a major advance in our understanding of the family Onagraceae, which itself represents one of the most characteristic plant families that have radiated in western North America, even though the family is cosmopolitan. This new publication provides a broad summary of the molecular, morphological, and geographical information on this important family, and should provide stimulus to additional research on a group that already is a model for plant evolutionary studies.



Cruising in Pacific Panama

Mark and Diane Littler, Barrett Brooks, Don Hurlbert and Jenifer Dorton, with the assistance of Panamanian student Irving Bethancourt, completed 125 ship-based scuba dives at 23 remote island locations in Pacific Panama during early September. Most of these locations had never been studied by marine botanists. Because of unusually benign weather and excellent boat support, the group was able to access high energy sites that usually prohibit collecting efforts.

More than 500 vials of wet specimens, 25 bulky coralline specimens, 25 pressed herbarium specimens and 260 molecular samples (silica gel and blotter cards) were processed aboard the R/V Urraca. In addition, 1,900 in situ macro-photographs of marine plants and more than 800 habitat photographs were taken for use toward a comprehensive flora and field guide of Panama. The molecular samples will be used for studies on speciation, evolution and cross-isthmus invasion by comparison with putative sister species collected from an earlier cruise to Caribbean Panama.

World's Smallest Bamboo Discovered among Specimens at USNH

Emmet J. Judziewicz and Sol Sep-senwol from the Department of Biology at the University of Wisconsin-Stevens Point have recently described a new plant species from French Guiana that is being touted as the world's smallest bamboo. Judziewicz, a research associate of the National Museum of Natural History's Department of Botany, discovered the specimens of the new bamboo during a research visit to the Smithsonian Institution in August 2006. The specimen is part of the Biological Diversity of the Guianas Program, headed by **Vicki Funk**.

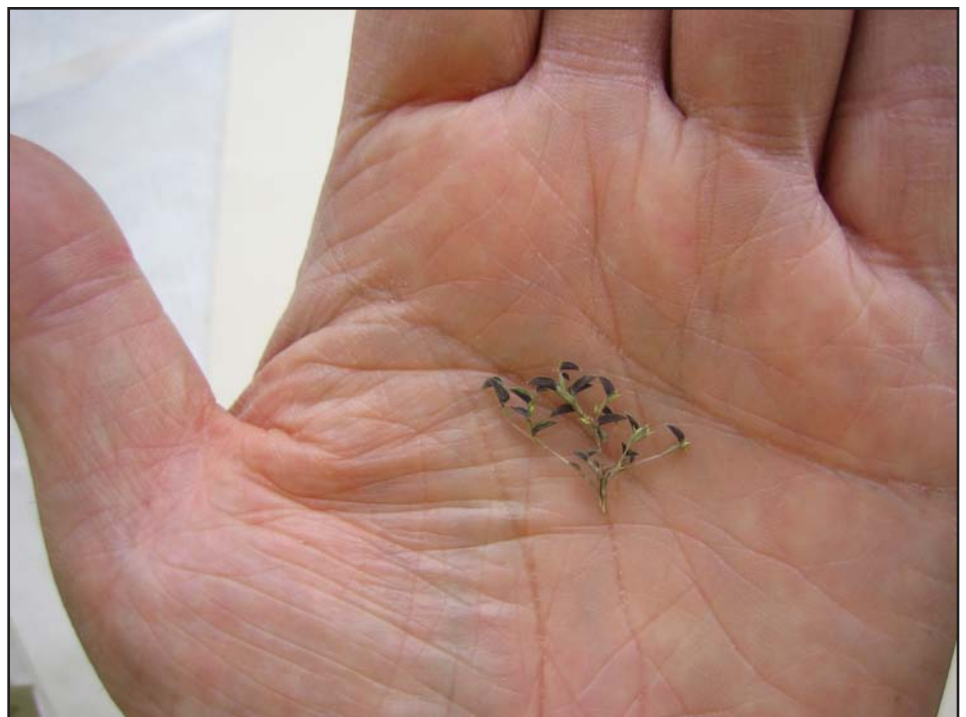
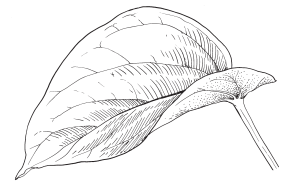
A description of the new species, *Raddiella vanessiae*, was published in the August 2007 issue of the *Journal of the Botanical Research Institute of Texas*. The mature flowering and fruiting plants are only 2 cm tall – less than 1 inch high. The fruits and seeds are slightly less than 1 mm long. It has larger relatives in the same genus (*Raddiella*) that range from 3-12 inches tall.

The species is considered a bamboo because the leaf anatomy is typical of that of much larger bamboos including species that can be up to 100 feet tall and are used for lumber or fishing poles. Also, chloroplast DNA data confirms that the genus

Raddiella nests comfortably within the clade (branch of the grass family evolutionary tree) that includes all bamboos.

The new species was collected by Vanessa Hequet, a French citizen working on the ecology of the savannas of French Guiana with funding from the World Wildlife Federation and the assistance of ORS-TOM (Office de la Recherche Scientifique et Technique de Outre-Mer), an agency of the French government. The species was named after her.

There are about 1,000 species of bamboos in the world; roughly 500 in the Old World (most common in Asia) and 500 in the New World (most common in Central and South America). In addition, there are probably at least several hundred bamboo species remaining to be discovered and formally described. The challenge is that many bamboo habitats such as remote mountain ranges and rain forests in South America have had very inadequate surveys for bamboos and many other organisms.



Raddiella vanessiae can sit comfortably in the palm of a hand. (Photo by Emmet Judziewicz)

Collecting Commelinaceae in Thailand

Robert Faden visited Thailand during the month of September to collect Commelinaceae for a treatment of the family for the Flora of Thailand Project that he is undertaking with his former student Thaweesak Thitimetharoch (Khon Kaen University). The trip was supported by Thitimetharoch and the Bangkok Forest Herbarium (BKF). Plants were collected in the southwest, north, east and northeast floristic regions.

Overall, approximately 37 taxa out of the 60 to 65 recorded from Thailand were collected, some as many as four times. DNA samples were collected for every species and nearly all populations. Of particular note among the species collected were the endemic *Spatholirion calcicola*, which is restricted to karst limestone hills; *Murdannia discreta*, which was collected at the type locality, where it had not been found since 1911; and *Murdannia clandestina*, an easily overlooked species that has rarely been collected and is usually misidentified. Within species, significant inter-population variation in flower color was found in the smaller form of *Murdannia simplex*. Two types of plants, differing in leaf color and pubescence and in

the presence or absence of thick roots were found within a single population of *Cyanotis arachnoidea*. The high elevation *Commelina* taxa were found to be rather confusing in their variation but to include at least one probably undescribed species.

Among the more common Commelinaceae encountered, Faden was satisfied to see in the field for the first time taxa such as *Murdannia japonica*, *M. edulis* and *M. spectabilis*, all of which Faden had given their present scientific names. The rains were late this year, so many species were not as far along in their reproductive cycles – sterile instead of flowering or flowering instead of flowering and fruiting – as had been anticipated, but nevertheless it was a very worthwhile trip.

Department Signs Indonesian Exploration MOU

The Department of Botany and the New England Tropical Conservatory (NETC) recently signed a Memorandum of Understanding (MOU) for the Indonesian Botanical Exploration and Taxonomy Project (IBETP). The objectives of the MOU are to provide a framework for the exchange of scientific and technical knowledge, to undertake joint field research in Indonesia, and to enhance

scientific and technical capabilities for the Department of Botany, NETC and Bogor Herbarium (BO) with respect to botany.

One focus of the MOU is on the collection, study and conservation of herbarium specimens, live plant material and related collections of the flora of Indonesia, especially *Begonia*, aroids, ferns, gesneriads and gingers, as well as conducting research on the taxonomy, geography, ecology and ethnobotany of the plants of Indonesia. *Ex-situ* collection and conservation of live plant material will be planted in the Indonesian Botanic Gardens, particularly Bali Botanic Gardens. The MOU will facilitate the opportunity for NMNH scientific personnel to undertake fieldwork in Indonesia. The MOU was signed by **Warren Wagner** and **W. John Kress**.

Guiana Shield Plant Checklist Is Published

The Guiana Shield region of South America has long held a fascination for tropical biologists because of its unique geography that includes table-top mountains known as tepuis, tropical savannas, and broad expanses of rainforest. These areas are home to many endemic taxa, as well as to unique ecosystems such as the Greenheart (*Chlorocardium*) forests of Guyana and the montane savannas of Brazil, Venezuela, and Guyana. Some of the largest expanses of untouched neotropical forests occur in these areas. “The Checklist of the Plants of the Guiana Shield,” published in the latest issue of the *Contributions from the United States National Herbarium* (55: 1-584; 2007), covers all vascular plants known to occur in the Guiana Shield region of northeastern South America. Edited by **Vicki Funk**, **Tom Hollowell**, Paul Berry, **Carol Kelloff** and **Sara N. Alexander**, it is the product of the combined efforts of two research initiatives: the Smithsonian Institution’s Biological Diversity of the Guiana Shield Program (BDG) and the Missouri Botanical Garden’s Flora of the Venezuelan Guayana project (FVG).

The plant checklist is a companion to the recently published *Checklist of the Terrestrial Vertebrates of the Guiana Shield* (Hollowell and Reynolds, eds. 2005). Together they represent a new research and



Spatholirion calcicola from Loei Province, Thailand. (Photo by Thaweesak Thitimetharoch)

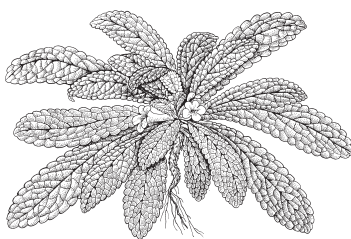
conservation resource, which highlights three critical facets of taxonomic work: research, collections, and expeditions. These volumes should be of particular use to students, taxonomists, ecologists, and conservation biologists as well as to interested amateurs. Both of these checklists were produced using information gathered from historical and recent collections as well as many recent expeditions to northeastern South America. The expertise of scientists from many organizations around the globe has been drawn together and made available to the scientific and conservation communities in both hard copy and on the web <<http://www.mnh.si.edu/biodiversity/bdg>>. Research projects such as this would not be possible without this international collaboration. BDG works with over 250 scientists who provide determinations for the collections.

The Guiana Shield is a geologic formation, and as such it defines a section of northeastern South America that is ideally a natural unit rather than a political one. This gives these two checklists (plants and terrestrial vertebrates) an environmental focus that is a first step toward thinking in terms of ecosystems, evolution, and systematics rather than simple lists of organisms. For instance, checklists tell us how many organisms of a certain kind are in a particular area, thus giving us an idea of the species richness. They serve as an indicator of endemism within an area and provide information on the number of introduced species. They can be used in a comparative manner between and among areas. Since this is a natural area they can be used to formulate questions about adaptive radiation, dispersal, and evolutionary history.

Conservation efforts are improved because the checklists provide standardized species nomenclature that will be used in both governmental and academic undertakings, including impact studies, reserve planning, ecological research, production of floral and faunal studies, and biogeographical analyses, allowing data sets from different sources to be compared with greater accuracy and confidence.

Both checklists exemplify the collaborative nature of studies in biological diversity science, being reflections of the efforts of so many specialists essential to their production. They are truly international efforts, for while the volumes were organized by the BDG staff, the authors

and experts who supplied identifications are based all over the world and in many types of organizations. The result affirms the common interests of all of the people, institutions, and nations involved in studying, understanding, and conserving the irreplaceable natural heritage of our world.



Collections Come to Life During Summer

Although the herbarium is a whirl of activity throughout much of the year, summer offers a greater opportunity for teaching professors, students, interns and volunteers to take advantage of the resources of the U.S. National Herbarium. The summer of 2007 was no exception.

Jun Wen's research projects attracted seven students, five of whom have continued into the fall. **Hongli Tian** (Beijing Institute of Botany; *Nelumbo*), **Tieyao Tu** (Kunming Institute of Botany; *Nolana*), **Lei Xie** (Chinese Academy of Sciences; *Clematis*, *Circaea*, *Fuchsia*), **Ki-Oug Yoo** (Kangwon National University; Vitaceae), and **Yunjuan Zuo** (Beijing Institute of Botany; *Panax*) have been working on their respective systematics projects both here and at the Smithsonian Museum Support Center (MSC). **Ying Meng** and **Zilong Nie**, both from Kunming, finished their project this summer on biodiversity conservation of Himalayan Tibet.

A team of students from St. Olaf College in Northfield, Minnesota arrived in June under the supervision of **Charles Umbanhower** to canvass the herbarium for Charles Geyer specimens that were collected during the historic Nicotlet Expedition of 1838-1839 in the upper Midwest and Plains states. **Kate Huber**, **Allie Pyan**, **Amanda Rubasch**, and **Becky Unkosky** worked with **Linda Hollenberg** to ferret out scores of specimens that provide an early and unique perspective on the flora of that region of the United States.

Two Earthwatch projects continued this summer, with **Alain Touwaide** (Medicinal Plant of Antiquity) and **Rusty Russell**

(Pacific Island Ethnobotany) recruiting volunteers through the Earthwatch Institute. Touwaide's group included a group of four students from George Washington University (**John Cotton**, **Jeffrey Leon**, **Sam Raker**, and **Bryan Randolph**) and Russell's volunteers numbered fourteen from around the country, each of whom spent one week cataloging Pacific Islands specimens. **Emily Gilmore**, an eight-week intern from Georgetown University, has coded the usage data for thousands of these specimens.

The project to document the plant collections of the U.S. Exploring Expedition attracted its typical summer contingent of students and volunteers. **Marissa Grunes** (Yale University), **Joe Kestell** (University of Maryland), **Maureen Murphy** (University of Mary Washington), **Trang Nguyen** (Virginia Tech), **Anthony Wallace** (George Washington University), **Charlotte Williams** (Brigham Young University), and high school students **Ben Han** (Virginia), **Sarah Miller** (Virginia), and **Lillian Okamuro** (California) worked with project manager **Bianca Lipscomb** to organize information that will significantly enhance these collections. New and ongoing volunteers included **Annette Heathwood**, **Anne Lamond**, **Nancy Mulry**, and **Linda Murkin** who busily transcribed hundreds of pages of original manuscript and correspondence related to this historic voyage.

W. John Kress hosted several students this past spring and summer who worked on several projects. Working on *Heliconia* population studies were **Antonia Posada** from Universidad de Antioquia, Medellin, Colombia, and **Laura Lagomarsino**, a Research Training Program (RTP) Intern, from the University of California at Berkeley. Both interns studied *Heliconia* collections in the herbarium and worked at MSC under the supervision of **David Erickson** and **Ida Lopez**. Summer intern **Maribeth Kniffin** (Smith College) gathered data on plant descriptions, general and ethnobotanic uses for the various species to be included in a soon-to-be-published book by Kress. Kniffin also assisted in a four-day collection trip to New York City. Postdoctoral fellow **Ling Zhang** (Kunming Institute of Botany and Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences) continues her fellowship through the end of the year working on the Instant Identification System Project.

Collecting Daisies in Africa

Vicki Funk spent the entire month of August in western South Africa, Namibia, and Botswana collecting daisies (Compositae or Asteraceae). Her counterpart for the trip was her colleague Marinda Koekemoer (Pretoria National Herbarium, PRE; South African National Biodiversity Institute, SANBI) who studies the Compositae tribe Gnaphalieae. The trip began with a mad dash from Pretoria to Namaqualand, South Africa, to collect in the northern part of the winter rainfall area. Namaqualand was in full flower in Namaqua National Park and west of Garies and further south. Anyone who has worked in one of the five Mediterranean areas of the world (Mediterranean, western South Africa and Namibia, California, Chile, and Western Australia) knows how difficult it is to predict the flowering in such areas. Everything can be in flower and just before one arrives a hot wind can sweep over the area killing all the flowers, or it can be rainy and cold and while one can collect the flowers they are all closed and so one cannot take good photos and there are no pollinators. This portion of the trip was mixed with rain and sun so the plants were in good shape but, of course, not perfect.

Many good collections were made including new locations for *Hoplophyllum spinosum* DC., a deep red *Arctotis* that could not be identified, both species of

Didelta (*D. spinosa* Ait. and *D. carnosa* Ait.), and *Berkheya spinosissima* Willd., and others, all of which are endemic to southwestern Africa. The plant collecting in Namaqualand was greatly helped by Annalise Le Roux, an expert on the flora and ecology of the area, who has founded a research and information center in Kamieskroon (Succulent Karoo Knowledge Center, SKS). The station is housed in an old school hostel and has everything one needs, including access to the internet, at reasonable rates. Scientists conducting research in Namaqualand (with all appropriate permits) are welcome to contact Le Ruex (contact Funk for email address).

The second phase of Funk's trip was Namibia and the collecting there was made possible through their collaboration with Esmeralda Klaassen and Coleen Mannheimer (The National Herbarium of Namibia, WIND). Klaassen is the Asteraceae expert from WIND and Mannheimer has just finished a book on the flora of southern Namibia. Between the two of them they knew all the best places to go in Namibia; this proved to be essential to the success of the trip because the winter rains had stopped early and most of the area was dry. Klaassen and Mannheimer knew which dry river valleys (all river valleys in southern Namibia are dry) to drive up to find the slopes and valleys that held the most moisture. It is safe to say that with-

out their participation the trip would have been much less productive.

As it was, although there were no "carpets of flowers" that one would like to see, the group did get most of what they needed. The top species on the "hit" list was *Eremothamnus marlothianus* O. Hoffm. a monotypic genus endemic to the Luderitz Bay area. *Eremothamnus* has long been a mystery to synantherologists. Its placement has moved around and it was only recently that Per Ola Karis (Nordic Herbarium, S) suggested that it was related to *Hoplophyllum* based on morphology and Harold Robinson (US) put them in a tribe by themselves (Eremothamneae). Molecular data generated by Funk and her collaborators confirmed that these two genera are sister taxa and added the information that they were on a long branch and that they were not members of either of the sub-tribes of the tribe Arctotideae where they had been most recently placed. While it is clear that the Eremothamneae belonged in the subfamily Cichorioideae its exact placement was in doubt. However, that conclusion was based solely on GenBank data from *ndhF*.

There were no collections of *Eremothamnus* at US and there were no recent collections in any herbaria. Since it is a shrub with succulent leaves it is important to have recent material for successful DNA sequencing. *Eremothamnus* is known only from the peninsula near Luderitz Bay in southern Namibia, just north of the diamond mining area. Finding this species was very important. With the help of Klaassen and Mannheimer three flowering populations of *Eremothamnus* were found and, along with the two *Hoplophyllum* collections from Namaqualand, they are currently being sequenced for multiple markers. The results of this analysis are critical in order to determine whether or not the Eremothamneae should be recognized as a separate tribe in the upcoming book on the Compositae. Also collected at Luderitz were several other endemic comps, all with succulent grey colored leaves very similar to *Eremothamnus*.

After the success in southern Namibia, Klaassen and Mannheimer headed north to Windhoek and Funk and Koekemoer headed northwest to Swapkomand to see the "holy grail" of seed plants, *Welwitschia mirabilis* Hook. f. It certainly lived



Eremothamnus marlothianus, a monotypic genus endemic to the Luderitz Bay area of southern Namibia. (Photo by Vicki Funk)



A field of flowering daisies in Namaqua National Park in Namaqualand, South Africa. (Photo by Vicki Funk)

up to its reputation as an unusual and very interesting plant. This was followed by a short visit to the herbarium in Windhoek where Funk and Koekemoer studied plants and Funk gave a seminar. One day they searched in vain for one of the species of another odd plant *Platycarpha carilinoidea* Oliv. & Hiern., but it was too dry in the Windhoek area. Molecular data place the three species of the genus *Platycarpha* on an unplaced long branch and in the same subfamily as the *Eremothamniae*. This species had already been collected by Koekemoer in the Northern Cape and sequenced by Funk and Raymund Chan but another population would have been nice.

Leaving Windhoek behind, Koekemoer and Funk took the weekend to visit Etosha National Park in northern Namibia where the dry weather caused many animals to visit the water holes. One day they saw a huge pride of 18 lions gathered at one waterhole. The lions were longing around and their presence made the other animals very nervous. At various times one of the lions would get up and stroll around the water hole causing all the other animals to scatter. It seemed as if the lions were just having fun asserting their authority; Funk reports that it was funny to see the basic element of all levels of politics revealed at an Etosha waterhole. Koekemoer and Funk both felt that the animals were a bit more skittish than those at Kruger National Park in South Africa but just as interesting and trying to photograph them without

getting eaten was fun as always.

Next on the agenda was the search for the perfect baobab tree, another first for Funk and high on her list of plants that she would like to see. On the way to baobab country they camped along the Kavonga River (where the vervet monkeys stole everything edible that was not locked in the truck), crossed over into Botswana, and visited the Okavonga Delta. The further they traveled from southern Namibia the dryer it became and by the time they reached Botswana it was very dry and

dusty. However, this was not unexpected since they had entered the summer rainfall area. The lack of collectable material caused them to reconsider the last part of the trip. They decided to cut the trip short and make a run for Pretoria. Fortunately their path took them by some amazing baobabs. Some of the best were found in a campground called “Planet Baobab” where the huge trees were in several different colors (pinkish, grayish, and light brown) and had amazing shapes. This campground also had bungalows and according to the guide book they were “found in the shade of the huge baobab trees.” Of course, it was the dry season and the “upside down tree” had no leaves so there was no shade anywhere.

The four extra days in Pretoria were spent at PRE drying their collections, measuring *Platycarpha* specimens, and writing a draft of a revision of the genus. Funk gave a seminar on her last full day in South Africa and then headed home. All in all, Funk reports that it was a great trip and gives all the credit to Koekemoer for her organizing, driving (nearly 9,000 Km in 3 weeks), and plant spotting and in Namibia to Klaassen and Mannheimer. Of course extra thanks go to PRE and WIND for all of their assistance and support. International collaborative research such as this is critical for modern day systematic research.



Vicki Funk was thrilled to find the baobab tree (*Adansonia digitata*) during her expedition throughout southern Africa. (Photo by Marinda Koekemoer)

Profile

Continued from page 1

also in turn stimulated speciation.

The *Pinus taiwanensis* forests in Sanqingshan are quite impressive. Here this pine species has crowns in various shapes in different elevations and habitats. Sometimes it is mixed with other broad-leaved species and often it is found in its pure forest by its own.

Mt. Sanqingshan is located in the middle subtropical zone and has the middle subtropical monsoon climate. It is about 340 km west of the Pacific Ocean, being obviously affected by the marine climate, yet simultaneously having mountain climate characters. It has four distinctive seasons: a cold and rainy spring, a hot and rainy summer, a dry autumn, and a cold and humid winter.

Geologically Sanqingshan is located at the conjunction between the Yangtze plate and the Huaxia plate. Unique geologic structure and suitable geographic environment make Sanqingshan famous for its granite hill forest physiognomy, with various shapes of ridges, peaks, and stone sprouts. Formation of the Mt. Sanqingshan granite had a direct bearing on the Paleo-Pacific plate movement. Sanqingshan granite is characterized by its diverse morphotypes, and multiple phases of diagenesis.

Sanqingshan is in the Jiangxi Province of eastern China situated next to the



Mt. Sanqingshan granite stone forest covered primarily with *Pinus taiwanensis*. (Photo by Jun Wen)

Tropic of Cancer. It is close to a number of naturally and culturally important places in eastern China. Jiangxi reaches the well-known Yangtze River to the north and is adjacent to Pacific Ocean to the east. There are more than 2,400 rivers in the province, most of which gather together in the Poyang Lake, then into the Yangtze River, and finally flow into the Pacific Ocean. Biodiversity is well preserved in Jiangxi with the forest coverage reaching up to 60.5% in the province. The Poyang Lake is now the largest freshwater lake

in China and one of the most important wetlands in the world, providing an important habitat for the migratory birds in the winter. Jiangxi is also famous for its ceramics-making techniques with Jingdezhen proclaimed as the “Porcelain Capital of China.”

With a rich flora and fauna, Mt. Sanqingshan is one of the richest centers of biodiversity in eastern China. Its diverse habitats, unique geographic position at the boundary of subtropics and the temperate zone, the little influence of the Quaternary glaciations, and its diversity of vegetation types have contributed to its remarkably rich assemblage of disjunct plants between Asia and North America in Sanqingshan. It preserves many relict species, yet is also an important center for active speciation.



***Actinidia arguta*, a wild kiwi fruit species from Mt. Sanqingshan, China. (Photo by Jun Wen)**



Publications

(† = deceased)

- Acevedo R., P.** and H.T. Beck. 2007. Sapindaceae, pp. 511-515. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Allen, B.H. and **R.R. Ireland**. 2007. A new species of *Bartramia* (Bartramiaceae) from Chile. *The Bryologist* 110(3): 506-509.
- Almeda, F., P.E. Berry, A. Freire-Fierro, A. Gröger, B.K. Holst, N.G. Luckana, F.A. Michelangeli, T. Morley, D. Penney, S.S. Renner, O.R. Robinson, **J.J. Wurdack†** and K. Yatskievych. 2007. Melastomataceae, pp. 397-417. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Alverson, W.S., **L.J. Dorr** and J.A. Steyermark†. 2007. Bombacaceae, pp. 220-223. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Andersson, L.L., **W.J. Kress** and P.J.M. Maas. 2007. Heliconiaceae, pp. 110. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Aymard C., G.A., P.E. Berry, R.S. Cowan†, N.L. Cuello A., A. Delgado Salinas, P.R. Fantz, R.H. Maxwell, K.M. Redden, **V.E. Rudd†**, M. Sousa and D.R. Wind. 2007. Leguminosae-Faboideae, pp. 346-365. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Aymard C., G.A., N.L. Cuello A. and **R.A. DeFilippis†**. 2007. Caryophyllaceae, pp. 237. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Aymard C., G.A., N.L. Cuello A. and **R.A. DeFilippis†**. 2007. Phytolaccaceae, pp. 457. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Aymard C., G.A., **R.A. DeFilippis†** and J.A. Steyermark†. 2007. Nyctaginaceae, pp. 443. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Aymard C., G.A. and **C.L. Kelloff**. 2007. Dilleniaceae, pp. 280-282. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Barringer, K.A., **C. Feuillet**, F.A. González G. and O. Poncy. 2007. Aristolochiaceae, pp. 207-208. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Berry, P.E., C.L. Cristóbal, **L.J. Dorr** and J.G. Saunders. 2007. Sterculiaceae, pp. 531-533. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Berry, P.E., N.L. Cuello A., B.K. Holst, D.M. Kearns, K. Kubitzki, J.J. Pipoly, N.K.B. Robson, P.F. Stevens and **A.L. Weitzman**. 2007. Clusiaceae, pp. 247-253. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Berry, P.E. and **R. Faden**. 2007. Comelinaceae, pp. 85-86. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Berry, P.E., R. Riina and **M.T. Strong**. 2007. Thurniaceae, pp. 177. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Berry, P.E. and **A.L. Weitzman**. 2007. Ternstroemiaceae, pp. 535-536. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Boggan, J.K.**, R.W. Cruden and A.W. Meerow. 2007. Liliaceae, pp. 112-114. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Bunting, G.S., T. Croat and **D. Nicolson**. 2007. Araceae, pp. 59-67. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.
- Camelbeke, K., P. Goetghebeur, M.S. González-Elizondo, D.M. Kearns, R. Kral, A.A. Reznicek, D.A. Simpson, **M.T. Strong**, W.W. Thomas and G.C. Tucker. 2007. Cyperaceae, pp. 88-103. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

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Publications

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livar, Delta Amacuro; Guyana, Surinam, French Guiana). Contrib. U.S. Natl. Herb. Washington, DC.

Chen, C.-J., P.C. Hoch and **W.L. Wagner**. 2007. *Gaura*. *Fl. China* 13: 427.

Chen, C.-J., P.C. Hoch and **W.L. Wagner**. 2007. *Oenothera*. *Fl. China* 13: 423-426.

Cremers, G., R.J. Hickey, **D.B. Lellinger**, J.T. Mickel, R.C. Moran, B. Øllgaard and A.R. Smith. 2007. Pteridophytes & Allies, pp. 17-56. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Cuatrecasas, J.†, O. Huber and D. Sibatier. 2007. Humiriaceae, pp. 316-318. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Davenport, L.J. and **R.A. DeFilipps†**. 2007. Lemnaceae, pp. 112. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

DeFilipps, R.A.† and D.M. Kearns. 2007. Chenopodiaceae, pp. 240. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the*



Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana). Contrib. U.S. Natl. Herb. Washington, DC.

DeFilipps, R.A.† and M.H. Nee. 2007. Amaranthaceae, pp. 187-189. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

DeFilipps, R.A.† and J.A. Steyermark†. 2007. Aizoaceae, pp. 187. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

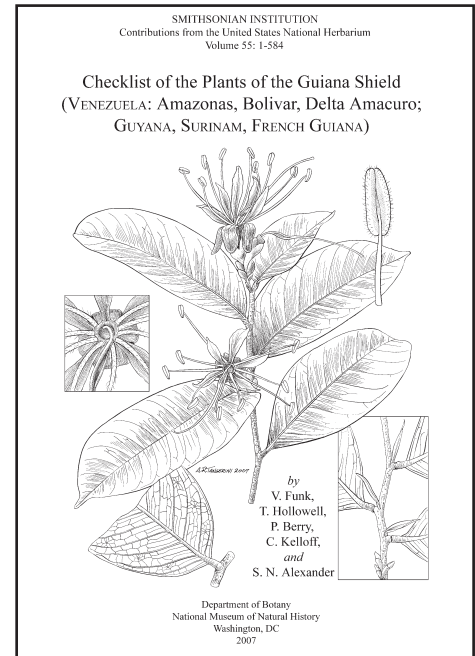
DeFilipps, R.A.† and J.A. Steyermark†. 2007. Basellaceae, pp. 213. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

DeFilipps, R.A.† and J.A. Steyermark†. 2007. Molluginaceae, pp. 422. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Dorr, L.J., P.A. Fryxell and M.J. Jansen-Jacobs. 2007. Malvaceae, pp. 393-396. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Dorr, L.J., M.J. Jansen-Jacobs and W. Meijer†. 2007. Tiliaceae, pp. 538-539. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Dorr, L.J., D.A. Smith and J.A. Steyermark†. 2007. Elaeocarpaceae, pp. 284-285. *In* V. Funk, T. Hollowell, P. Berry, C.



Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Feuillet, C. 2007. Folia taxonomica 1. Validation of two taxa from northern South America. *J. Bot. Res. Inst. Texas* 1(1): 143-144.

Feuillet, C., J. Gaviria, R. Gómez, J.S. Miller and G. Rodríguez. 2007. Boraginaceae, pp. 224-226. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Feuillet, C., M. Hoff and M.-M. Arbo. 2007. Turneraceae, pp. 540-542. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Feuillet, C., **L.E. Skog** and J.A. Steyermark†. 2007. Gesneriaceae, pp. 309-312. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Feuillet, C. and S.S. Tillett. 2007. Passifloraceae, pp. 454-456. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Funk, V., T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. 2007. Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana). *Contrib. U.S. Natl. Herb.* 55: 1-584.

Funk, V.A., H. Robinson and J.F. Pruski. 2007. Compositae, pp. 255-269. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Ickert-Bond, S., K.B. Pigg and **J. Wen.** 2007. Comparative infructescence morphology in *Altingia* Noronha and discordance between morphological and molecular phylogenies. *Am. J. Bot.* 94: 1094-1115.

Kral, R. and **M.T. Strong.** 2007. Xyridaceae, pp. 178-182. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Lapointe, B.E., B.J. Bedford, **M.M. Littler** and **D.S. Littler.** 2007. Shifts in coral overgrowth by sponges and algae. *Coral Reefs* 26(3): 515.

Lindeman, J.C., J.A. Steyermark† and **D. Wasshausen.** 2007. Begoniaceae, pp. 213-214. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Littler, M.M., D.S. Littler and B.L. Brooks. 2007. Target phenomena on south Pacific reefs: strip harvesting by prudent pathogens? *Reef Encounter* 34: 23-24.

Liu, Q., **P.M. Peterson**, J.T. Columbus, N. Zhao, G. Hao and D. Zhang. 2007.

Inflorescence diversification in the “finger millet clade” (Chloridoideae, Poaceae): a comparison of molecular phylogeny and developmental morphology. *Amer. J. Bot.* 94(7): 1230-1247.

Nie, Z.L., **J. Wen** and H. Sun. 2007. Phylogeny and biogeography of *Sassafras* (Lauraceae) disjunct between eastern Asia and eastern North America. *Plant Syst. Evol.* 267: 191-203.

Raechal, L.J. and **M.T. Strong.** Typhaceae. 2007, pp. 178. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Verbruggen, H., F. Leliaert, C.A. Maggs, S. Shimada, T. Schils, J. Provan, D. Booth, S. Murphy, O. De Clerck, **D.S. Littler, M.M. Littler** and E. Coppejans. 2007. Species boundaries and phylogenetic relationships within the green algal genus *Codium* (Bryopsidales) based on plastid DNA sequences. *Mol. Phylogenet. Evol.* 44(1): 240-254.

Verbruggen, H., **D.S. Littler** and **M.M. Littler.** 2007. *Halimeda pygmaea* and *Halimeda pumila* (Bryopsidales, Chlorophyta): two new dwarf species from fore reef slopes in Fiji and the Bahamas. *Phycologia* 46(5): 513-520.

Wagner, W.L., P.C. Hoch and P.H. Raven. 2007. Revised classification of the Onagraceae. *Syst. Bot. Monogr.* 83: 1-240.

Wasshausen, D. 2007. Acanthaceae, pp. 183-187. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Wasshausen, D. 2007. Mendoniaceae, pp. 419-420. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb. Washington, DC.

Wasshausen, D.C. 2007. A checklist of the Acanthaceae collected in the “Sira

mountains” of Peru. *Ann. Naturhist. Mus. Wien* 108B: 167-190.

Weitzman, A.L. 2007. Theaceae, pp. 536-537. *In* V. Funk, T. Hollowell, P. Berry, C. Kelloff and S.N. Alexander. *Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana)*. Contrib. U.S. Natl. Herb.

Wen, J., Z.-L. Nie, A. Soejima and Y. Meng. 2007. Phylogeny of Vitaceae based on the nuclear GAI1 gene sequences. *Can. J. Bot.* 85: 731-745.

Wortley, A.H., **V.A. Funk, H. Robinson, J.J. Skvarla** and S. Blackmore. 2007. A search for pollen morphological synapomorphies to classify rogue genera in Compositae (Asteraceae). *Rev. Paleobot. Palynol.* 146(2007): 169-181.

Yi, T.-S., A.J. Miller and **J. Wen.** 2007. The phylogeny of *Rhus* (Anacardiaceae) based on sequences of nuclear NIA-i3 intron and chloroplast trnC-D suggests reticulate evolution. *Syst. Bot.* 32: 379-391.

Yoo, K.-O. and **J. Wen.** 2007. Phylogeny of *Carpinus* and *Coryloideae* (Betulaceae) based on chloroplast and nuclear ribosomal sequence data. *Plant Syst. Evol.* 267: 25-35.



Art by Alice Tangerini

***Panax wangianus* S.C. Sun**

Mt. Sangqingshan, China, is very species-rich, and some plant species from the mountain have not yet been described. These include a *Panax* species which is closely related to *Panax wangianus*. *Panax wangianus* grows in mid-altitude areas on mountains in south-central China, with its type collected from Mt. Emei of Sichuan province. Rhizomes of *Panax wangianus* have been used by the locals as a blood-regulating medicine and a tonic.



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