Department of Botany & the U.S. National Herbarium

The Plant Press

Smithsonian
National Museum of Natural History

New Series - Vol. 14 - No. 1 January-March 2011

Botany Profile

Seeking the Botanical Frontier in Guyana

By Sara Alexander, Kenneth Wurdack, and Karen Redden

Over almost three weeks in the field in the summer of 2010, Biological Diversity of the Guiana Shield Program (BDG) botanical expedition members had traveled from the capitol of Guyana, Georgetown, to the tepui-encircled town of Imbaimadai in the interior of the country, and almost to the Venezuelan border in a quest to reach Mount Tulameng. They had traveled by small aircraft over mountains and coaxed a leaky dugout canoe up the flooded Mazaruni River, the Kako River, and finally the shallow vine-festooned Cara Creek. There were daily downpours and rampant mildew. A tree frog visited the camp kitchen one morning, adding transparent eggs to the bucket that was collecting rainwater runoff from a tarp and that had been intended for drinking. During eight days of hiking and camping on the slopes of Tulameng, they had ascended through the rainforest using inconspicuous trails cut and expertly navigated with compass, GPS, and intuition by the team's Amerindian guides.

In the process, the team had collected hundreds of specimens towards their goal of 800 numbers, as well as capturing a large photographic library. During a four-hour, 600-meter elevation-gain hike toward the summit of Tulameng, the team encountered cloud forests dripping with bryophytes, rocky streams bridged by single logs, a nest of painful bullet ants (*Paraponera clavata*), and a tribe of jeering monkeys. The team briefly admired the low montane forest they found and began their descent soon after in order to reach camp before nightfall.

They anticipated good collecting when returning the next day, instead they were then faced with downpours of chilly rain – 55° F read the pocket thermometer attached to a compass – that obscured the view, made the slopes treacherous, and coated everyone's pants legs in slippery mud. During times like these the only thing that could be done was to keep moving and muse, "Well, we are in a rainforest… during the rainy season."

Mountains higher than 1,500 meters are few in Guyana and clustered in the Pakaraima Mountains in the west-central part of the country. Tulameng was targeted for this expedition as one of these 1,500 meter peaks that had not yet been botanically explored, and because reasonably close water access made it logistically practical.

The higher altitudes in Guyana are especially interesting to biologists due to their unusual biota with frequent new species and new records, and thus have been objectives of BDG expeditions. They are part of the famous Lost World region of northeastern South America, especially in southern Venezuela and adjacent Guyana, with its sandstone table mountains or tepuis jutting out of the jungle and often surrounded by nearly insurmountable vertical rock escarpments.

In looking at this region in terms of physiographic units, the plateaus and peaks of 1,500 to 3,000 meters form the Guiana (or Guayana) Highlands and the middle altitudes of 500 to 1,500 meters are uplands (see Steyermark et al. 1995, *Flora of the Venezuelan Guayana*. *Vol. 1*). Despite the island-like nature of the scattered, discontinuous highlands summits, they share a similar biota that is quite different from the biota of lower elevations. The Guiana Highland region is underlain by the broader Guiana Shield, one of the oldest geological formations in South America, which harbors approximately 20 percent of Neotropical plant diversity including high levels of endemicity.

The Pakaraima Mountains form a broad, largely wilderness region of uplands with blackwater rivers, spectacular waterfalls such at Kaieteur Falls, and punctuated by highlands and lower peaks. It is an area rich in savanna and scrub that form a mosaic with forested regions. The highlands in this region include Ayanganna, Kamakusa, Karanang, and Wokomung/Kopinang, and eight or so summits including Tulameng associated with northwesterly tacking tepui chain along the borders of Guyana with Venezuela or Brazil between Cerro Venamo at the north, and Roraima and Maringma to the south and east, respectively. This tepui chain forms the divide between major river basins, with the eastern side draining into tributaries of the Essequibo River of Guyana and the western side draining into the Orinoco River basin of Venezuela.

References to Tulameng are few. The name translates as "cave drawing" in the local Amerindian dialect (fide Virgil Roland). In June 1911, the missionary O.E. Davis while traveling between Paruima Mission (founded by Davis and still extant) and Roraima, established

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Travel

Walter Adey traveled to Toronto, Canada (11/15 – 11/17) to give a presentation at the University of Toronto; and to Kalamazoo, Michigan (11/17 – 11/19) to meet with colleagues at the University of Western Michigan.

Christian Feuillet travelled to Sarasota, Florida (10/13 – 10/16) to give a talk at the World Gesneriad Research Conference at Marie Selby Botanical Gardens.

Vicki Funk traveled to Christchurch, New Zealand (11/29 – 12/5) to present a talk on "Understanding Evolution in Large Clades: Novel Solutions to Global Problems in the Largest Flowering Plant Family on Earth" at a joint meeting of botanical systematists sponsored by the Australian Systematic Botany Society and held at Lincoln University, New Zealand.

W. John Kress traveled to New York, New York (11/15; 12/9 – 12/10) to attend a meeting of the electronic field guide group at Columbia University with **Ida Lopez**, and to attend a graduate student's thesis defense.

Laurence E. Skog traveled to Sarasota, Florida (10/11 – 10/16) to attend the World Gesneriad Research Conference and to work in the herbarium at the Marie Selby Botanical Gardens.

Alain Touwaide and **Emanuela Appetiti** traveled to Madison, Wisconsin (10/22 – 10/24) to present a talk at a conference on the history of pharmacy; to Dallas, Texas (10/26 – 11/2) to deliver a lecture at the Fort Worth Botanical Gardens and a lecture at the Botanical Research Institute of Texas; to Montreal, Canada (11/4 – 11/7) to chair a panel at the annual meeting of the History of Science Society and to attend the meeting of the Editorial Board of *ISIS-Current Bibliography*; and to New York, New York (12/2 – 12/3) to present a talk at the annual conference of the Global Hellenic Medical & Biosciences Network.

Warren Wagner traveled to Sarasota, Florida (10/12 – 10/15) to present an invited talk at the World Gesneriad Research Conference at the Marie Selby Botanical Gardens; and to Miami, Florida (11/12 – 11/17) to attend a National Tropical Botanical Garden board meeting.

Jun Wen traveled to Singapore and Malaysia (10/17 – 11/2) to conduct field work on *Dendropanax* (Araliaceae); and to London, England, and Leiden, Netherlands (12/5 – 12/17) to conduct herbarium studies of Southeast Asian *Prunus*.

The Plant Press

New Series - Vol. 14 - No. 1

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Web site: http://botany.si.edu/

Visitors

Mike Martin, Johns Hopkins University; *Ambrosia* (Compositae) (1/1/09-6/30/11).

Jimmy Triplett, University of Missouris; North American *Arundinaria*, and Asian *Pleioblastus*, *Sasa*, and *Sasamorpha* bamboos (Poaceae) (1/1-12/31).

Jianying Xiang, Kunming Institute of Botany, China; *Dryopteris* (Dryopteridaceae). (1/1-12/31).

Li-min Lu, Chinese Academy of Sciences; *Parthenocissus* (Vitaceae) (4/1/10-3/31/11).

Zhou Zhuo, Kunming Institute of Botany, China; *Cyanthus* (Campanulaceae) (4/1/10-3/29/11).

Adriana Mendoza, University of Maryland; Medicinal plant barcoding (6/7-12/31).

Marina Cortes, Columbia University; *Heliconia* (Heliconiaceae) (7/6-12/31)

Carlos García-Robledo, University of Miami; Plant-herbivore interactions (7/20/10-7/19/11).

Sean Carrington, University of the West Indies, Cave Hill Campus, Bridgetown, Barbados; Lesser Antilles seed plant endemics (8/4-10/31).

Juan Chen, South China Botanical Garden, Guangzhou, China; *Curcuma* (Zingiberaceae) DNA barcodes (8/9-2/15/11).

Hannah Ahn, University of Michigan; Plant conservation internship (9/1-12/2).

Nevien O'Keeffe, George Mason University; *Quercus* (Fagaceae) (9/17- 12/31).

Doel Soejarto, University of Illinois at Chicago; Southeast Asian Actinidiaceae (10/4-10/8).

Noel and **Patricia Holmgren**, New York Botanical Garden; Intermountain flora (10/12-10/16).

Gilberto Ocampo, California Academy of Sciences; Miconieae (Melastomataceae) (10/13-10/15).

Fabio Avila, Herbario Forestal Universidad Distrital, Bogota, Colombia; *Lasiocephalus* (Compositae) (10/18-11/11).

Wayt Thomas, New York Botanical Garden; *Rhynchospora* (Cyperaceae) (10/25-10/26).

Mario Terra Araujo, Instituto Nacional de Pesquisa da Amazônia, Manaus, Brazil; Brazilian Sapotaceae (10/25-10/26).

Mayara Caddah, Universidad Estadual de Campinas, Brazil; *Miconia* (Melastomataceae) (10/25-10/28).

Juliana Rando, University de São Paulo, São Paulo, Brazil; Brazilian *Chamaecrista* (Fabaceae) (10/25-10/26).

Dan Skean, Albion College; *Calycogonium* and *Mecranium* (Melastomataceae) (10/25-10/29).

John Emerson, University of Wisconsin-

The Evolution of Life on Pacific Islands and Reefs: Past, Present, and Future

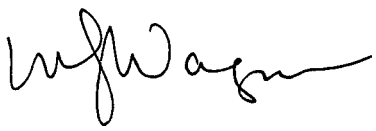
The Pacific realm occupies a third of the planet's geographic area and includes over 25,000 distinct islands which are scattered across the Pacific Ocean. As a group the Pacific Islands have long been known for their remarkable diversity of ecological environments and a high level of endemism in the flora and fauna. The biota of the Pacific islands are currently experiencing dramatic ecological shifts stemming from species endangerment and extinction, environmental deterioration, invasive species, global climate change, and the loss of indigenous knowledge about biodiversity. To better understand the rapid changes which are occurring in the ecological and evolutionary processes of the region Smithsonian researchers, together with many external collaborators from across the Pacific Region are organizing an international symposium on the biogeography of Pacific Islands and Reefs.

The symposium*, The Evolution of Life on Pacific Islands and Reefs: Past, Present, and Future,* will be held at the East West Center in Honolulu, Hawaii from May 26-29, 2011. The symposium will provide Pacific biologists, geologists, cultural experts, and students a forum for the active discussion of current research being undertaken in the Pacific while building the foundation for future research initiatives, collaborations and publications. The three-day conference will include five scientific sessions with invited speakers and contributed papers, pre-conference workshops, poster sessions, a luau banquet, and field trips.

The event is being organized by a cross-disciplinary, multi-institutional committee of 16 scientists and is currently sponsored by a group of five prominent institutions, including the Smithsonian Institution, National Tropical Botanical Garden, and the University of Hawaii. Committee members also serving as session organizers include David Burney, National Tropical Botanical Garden; Chris Filardi, American Museum of Natural History; Rosemary Gillespie, University of California, Berkeley; Patrick O'Grady , University of California, Berkeley; Gustav Paulay, Florida Museum of Natural History; Jon Price, University of Hawaii, Hilo; and Tom Ranker, University of Hawaii, Manoa. A conference coordinator, Nancy Khan, NMNH, is providing logistical and communications support.

Symposium highlights will include special presentations by Bruce Baldwin, University of California, Berkeley; Brian Bowen, University of Hawaii; Kerry Shaw, Cornell University; Alice Cibois, Natural History Museum of Geneva; Michael Soule, University of California, Santa Cruz; and other knowledgeable experts. As well, a pre-conference workshop on current plant conservation efforts will report on some of the approaches currently being taken in Hawaii, with the hope of stimulating discussion and feedback during the symposium. The event will conclude with a traditional Hawaiian luau at the Bishop Museum. Additional information and online registration can be accessed at http://botany.si.edu/events/2011_pacific/index.htm.

As a member of the executive planning committee I have been involved in developing this symposium from its inception with other Smithsonian researchers including Rob Fleischer, NZP/NMNH; Vicki Funk, NMNH; Doug Herman, NMAI; Helen James, NMNH; and Chris Meyer, NMNH. I am excited that this international symposium will significantly advance the knowledge base and information sharing of Pacific researchers and build the foundation for creating an integrated, cross-cutting program of Pacific research and education, coordinated at the Smithsonian Institution.



Chair With A View

Warren L. Wagner

Milwaukee; Chinese *Anemone* (Ranunculaceae) (10/29).

O. Brent Berlin, University of Georgia, Athens; Senate of Scientists Banquet and ethnobotany collections (10/30-11/5).

Eve Lucas, Royal Botanic Gardens, Kew; **Piero Delprete**, Institut de Recherche pour le Developpement, Herbier de Guyane, Cayenne, French Guiana; **Marion Jansen-Jacobs**, Nationaal Herbarium Nederland, Leiden, Netherlands; **Scott Mori**, New York Botanical Garden; **Odile Poncy**, Museum d'Histoire Naturelle, Paris, France; **Phillip Da Silva**, University of Guyana, Tain Campus; **Benjamin Torke**, New York Botanical Garden; and **Tinde van Andel**, National Herbarium of the Netherlands, Leiden, Netherlands; Flora of the Guianas biennial meeting (11/1-11/7).

Juliana Santos, Universidade Estadual de Campinas, São Paulo, Brazil; *Mimosa* (Fabaceae) (11/7-11/12).

Jean Gerrath, Northern Iowa State University, and **Steven Manchester**, Florida Museum of Natural History; Vitaceae (11/10-11/13).

Vinita Gowda, Indian Institute of Science, Bangalore, India; *Alpinia* (Zingiberaceae) (11/15/2010-3/31/2012).

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Staff Research & Activities

During the fall, **Gary Krupnick** and **Alice Tangerini** continued their promotion of the traveling exhibition "Losing Paradise: Endangered Plants Here and Around the World." On 7 October, Krupnick and Tangerini participated in an exhibit catalog book signing at the NMNH Gallery Store. On 14 October, they taught a class "The Art and Science of Botanical Illustration" through the Smithsonian Associates program. The class included a tour of the exhibition and a botanical illustration workshop. Using color pencils on drafting film Tangerini showed the class how to achieve the look of an orchid and a hibiscus from examples of Carol Woodin's and Wendy Hollender's artwork in the exhibit. Krupnick and Leslie Overstreet, curator of natural history rare books, taught three additional Smithsonian Associates classes, "U.S. National Herbarium and the *Botanica Magnifica*" on 26 October, 5 November, and 10 November. The classes included a behind-the-scenes tour of the U.S. National Herbarium and a viewing of the Jonathan Singer and **John Kress** large-format book, *Botanica Magnifica*, at the Joseph F. Cullman 3rd Library of Natural History.

Khamila Opiotionne-Renshaw recently completed a six-month internship, working with **Alice Tangerini**. Opiotionne-Renshaw came highly recommended as a high school student with an interest in art and computer graphics and she exceeded all expectations. Tangerini gave Opiotionne-Renshaw the task of scanning all of the *Begonia* drawings in the Botanical Art Catalog including early illustrations made by **Lyman Smith**. All of the scans of the drawings involved a heavy amount of cleaning, and in addition labels and scale markings needed to be added in Photoshop as many had only scales in penciled handwriting on the originals. Her dedication to removing dust from the scans has not been matched. Opiotionne-Renshaw added figure numbers and letters to the scans which then could be noted in the database entry and she then uploaded the scans to the database. She also remounted all of the illustrations onto archival boards, added the printed labels, removed harmful adhesive tape and improved the quality of the entire *Begonia* collection.

Staff Retirements

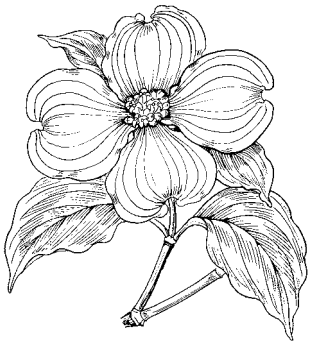
Shirley Maina retired from the Department of Botany on 1 January 2011. Maina began her career 40 years ago, as a Museum Specialist in the Office of Ecology at the National Museum of Natural History. In 1975 she transferred to the Scientific Event Alert Network (SEAN). She joined the Department of Botany in 1982 as a research assistant for **Mark Littler**. Over the years she transferred to the original Plant Conservation Unit, the Latin American Plants Program, the Floristics Office, and most recently to the revised Plant Conservation Unit under the supervision of **Gary Krupnick**.

Awards & Grants

Carlos García-Robledo, postdoctoral fellow, has been selected as a 2011 Encyclopedia of Life (EOL) Rubenstein Fellow. EOL is an international collaboration of scientific organizations and the general public with the shared mission to gather and share knowledge about all 1.9 million known species on the planet. Sixteen early-career scientists were chosen and will use EOL as a platform for sharing their biodiversity research with their colleagues and the general public. EOL Rubenstein Fellows awards are made possible through a generous donation by David M. Rubenstein to the Smithsonian Institution's National Museum of Natural History. EOL Rubenstein Fellows are selected on the basis of stellar achievement, promise for continued accomplishment, and the diversity and relevance of their research. This year's recipients specialize in a variety of taxonomic areas, ranging from rhododendrons of the world to African birds to flower flies.

García-Robledo is interested in modeling cascades of co-extinctions of insect herbivores under projected climate change and exploring the ecology, genetics, and evolutionary processes involved in the adaptation of insect herbivores to novel host plants. For his research, he uses Neotropical plants from the order Zingiberales and their insect herbivores, beetles from the genus *Cephaloleia* as a model system. His objective as a Rubenstein Fellow is to include taxonomic, ecological, phylogenetic, and evolutionary information for this well-documented plant-herbivore interaction in the Encyclopedia of Life. For a full list of EOL Rubenstein Fellows, their specialties, and their institutional affiliations, please visit the 2011 EOL Rubenstein Fellows page <http://www.eol.org/content/page/2011eolfellows>.

Alain Touwaide and **Emanuela Appetiti** have been appointed as Research Associates of BRIT – Botanical Research Institute of Texas. Touwaide has also been appointed as Fellow of the Royal Society of Medicine, UK.



Grand Challenge Awards

The Smithsonian Institution's Under Secretary for Science, the Under Secretary for History, Art, and Culture, and the four Consortia Directors have announced the recipients of the 2010 Grand Challenges Awards. Smithsonian Grand Challenges Awards advance cross-disciplinary, integrated scholarly activities across the Institution which relate to one or more of the four Grand Challenges: *Unlocking the Mysteries of the Universe, Understanding and Sustaining a Biodiverse Planet, Valuing World Cultures, and Understanding the American Experience*. These awards seek to advance research, as well as to broaden access, revitalize education, strengthen collections and encourage new ways of thinking that involve emerging technology.

Sixteen Level One and 13 Level Two awards were made. The Level One grants

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

Within the Department of Botany, two teams received funding: Level One project "Developing and Establishing the North American Orchid Center," led by principal investigators Dennis F. Whigham (SERC), Barbara Faust (Smithsonian Gardens), Charles Fillah (NZP), **Gary Krupnick** (NMNH), and Holly Shimizu (U.S. Botanic Garden); and Level Two project "Next Generation Sequencing: Enabling Transformative Technology for Biodiversity Research and Collections," led by principal investigators, Seán Brady (NMNH), Michael Braun (NMNH), Robert Fleischer (NZP), Owen McMillan (STRI), and **Kenneth Wurdack** (NMNH) and also including **Jun Wen** (NMNH) among the co-investigators.

Science and Engineering Festival

The inaugural USA Science and Engineering Festival, "the ultimate multi-cultural, multi-generational and multi-disciplinary celebration of science in the United States" was held on the National Mall on 23-24 October 2010. Over 1,500 science and engineering activities attracted an estimated half million attendees during that weekend. Events offered "something for everyone from science professionals to the merely curious."

Partners on the Mall (the United States Botanical Garden and the NMNH Department of Botany) sponsored a booth for this inaugural event. Lee Coykendall, Christine Flanagan, Libby Rhoads from the US Botanical Garden, and **John Kress** and **Ida Lopez** from the Botany Department, exhibited a booth titled "From Ancient Algae to Apps" during the weekend event. Participants could enter the mock botanical field station tent and experience Botany from a traditional- to a digital- age mode. Booth guests could look at algae under microscopes, feed carnivorous plants, and identify a tree by using the LeafID iPhone app. Assisting in the exhibit's "Ask the Botanist" post were Norm Bourg, Juan Chen, David Erickson, Bill McLaughlin, Karen Redden, Kyle Wallick, and Andrea Weeks. Numerous volunteers from the USBG assisted with the microscopes and carnivorous plants. About 125 visitors per hour participated in booth activities.

50 Years of Mounting Specimens

Celebrating her 50th year at the Smithsonian, **Mary Skinner** has significantly contributed to the U.S. National Herbarium by crafting well-mounted plant specimens, mounting an estimated 150,000 specimens in that time. She began her career as a plant mounter at the Smithsonian in 1961. During some single years she mounted as many as 5,000 specimens, serving this Institution and other government agencies. Since her retirement from the Smithsonian in 1986 up to the present day, she has continued to mount specimens for the Biological Diversity of the Guiana Shield Program, which are also deposited in the U.S. National Herbarium. Her service and her career as a plant mounter is so remarkable that she was recently featured in the *Roanoke Times* (Virginia) on December 8, 2010; the full text can be found on the Roanoke Times website at http://www.roanoke.com/news/roanoke/wb/268209.

Visitors

Continued from page 3

Charles Zartman, Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil; *Syrrhopodon* (Calymperaceae) (11/16-11/30).

Peggy Mihelich, AAAS/*Science*; Interview (11/18).

Marcos Caballo and **Mario Flores Mangual**, Pennsylvania State University; New World Loranthaceae, Viscaceae and Eremolepidaceae (11/22-11/24).

Christine Bacon, Colorado State University; *Pritchardia* (Arecaceae) (11/23-12/10).

Rick McNeill, U.S. Forest Service, White River National Forest, Colorado; *Lomatium* (Apiaceae) (11/29-12/3).

Genise Freire, Universidade Federal Rural do Rio de Janeiro, Brazil; Sapindaceae (12/1/2010-12/31/2011).

Adrian Higgins, *Washington Post*; Interview (12/1).

Melissa Keys, Australian Embassy, and **Gregory** and **Yihsin Chang Pryor**, Edith Cowan University, Australia; *Historia Plantarum* book collection (12/6).

George Yatskievych, Missouri Botanical Garden; Missouri flora (12/6).

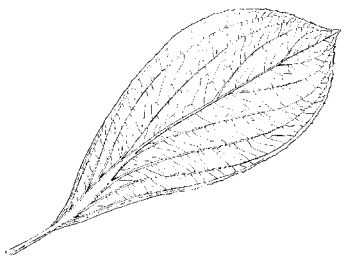
Keri Barfield, **Pat Harrison**, and **Will McClatchey**, Botanical Research Institute of Texas; Collaborative research (12/7).

Susan Leopold, Oak Spring Garden Library, Virginia; *Historia Plantarum* book collection (12/13).

Daniel Atha, New York Botanical Garden, and **James Reveal**, Cornell University; *Persicaria* (Polygonaceae) (12/16-12/17).

Gail Percy, Sonam Dubal; *Historia Plantarum* book collection (12/22).

Andrew Henderson, New York Botanical Garden; Arecaceae (12/27).



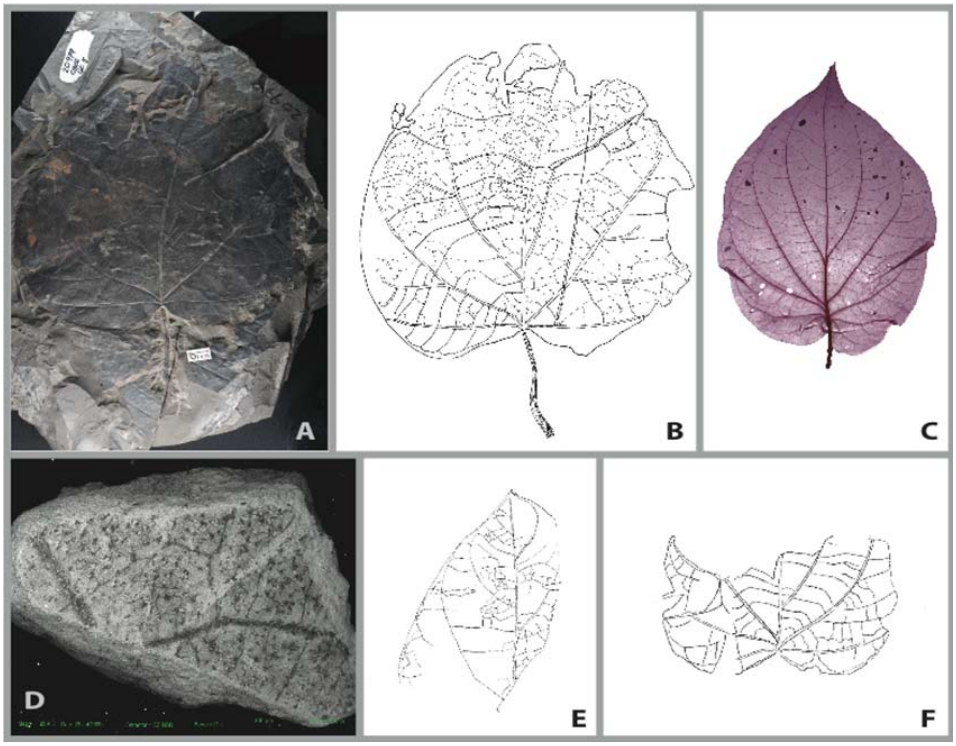
Recipients of the Jose Cuatrecasas Award Visit NMNH

The following botanists visited the U.S. National Herbarium with the support of a 2010 Cuatrecasas Award.

Fabio Ávila, from the Universidad Distrital in Bogota, Colombia, visited for a month (18 October – 19 November). He identified, evaluated, and circumscribed the species of the neotropical genus *Lasiocephalus* Willd. ex Schltdl., within the Senecioneae group of Compositae. Since the last reinstatement by Cuatrecasas in 1974, the genus has been without new advances in its systematic. In this way, he is supporting in the taxonomy of the genus for further advances in its phylogeny. His previous research was conducted at the Charles University in the Czech Republic. During his stay, Ávila revised about 400 specimens and the type collections of four species of *Lasiocephalus*. In his revision, he proposed the synonyms by locating two names published in the former work of Cuatrecasas: *L. caldasensis* and *L. mochensis,* in *L. involucratus* and *L. loeseneri*, respectively. Thus, he could confirm the identity of 12 species for Colombia and circumscribe the genus to 20 names in the tropics. He also corrected the older names, since the group was taxonomically considered within *Senecio.* In addition, he achieved to recognize the morphologic variation of the complex *L. otophorus*, under infra-specific categories by Cuatrecasas. Ávila's research will contribute to the phylogeographic studies in that species in the Andean Range. Finally, the Cuatrecasas Fellowship has made it possible to review all the variation of the genus from Venezuela to Bolivia, and supported the last steps for a next issue of the Flora of Colombia.

Fabio Ávila

The research of **Camila Martínez Aguillón**, from the Universidad de los Andes, Colombia, focuses on dating of plant phylogenies based on the fossil record and molecular data, biogeographical reconstructions and the diversification processes in the Neotropics. Her Master's thesis focuses on the identification of a leaf morphotype called GD5 from the Guaduas Formation of the Late Cretaceous of Colombia, based on morphological and anatomical characters. During her visit to the Smithsonian, Martínez Aguillón focused on the identification of leaf morphotypes and a broad revision of the overall morphology of angiosperms that present a similar morphology as the morphotype GD5 (left). Some of the genera that she revised belong to Menispermaceae, Aristolochiaceae, Fabaceae, Euphorbiaceae and Piperaceae. Once the revision of the cleared leaves was completed, she concluded that the Piperaceae shared more characters with the fossil than any of the other families. She made a bibliographic revision of previous macrofossils associated with the family and fortunately three of them were stored in the U.S. paleobotanical collection. Martínez Aguillón then made a wide revision of the order Piperales, including other genera of the families Aristolochiaceae, Hydnoraceae and Saururaceae. Within Piperaceae she evaluated the genera *Zippelia*, *Manekia* and *Verhuellia*. Given that *Piper* is a pantropical genus with around 2,000 species, she decided to describe the leaf architecture of the genus,

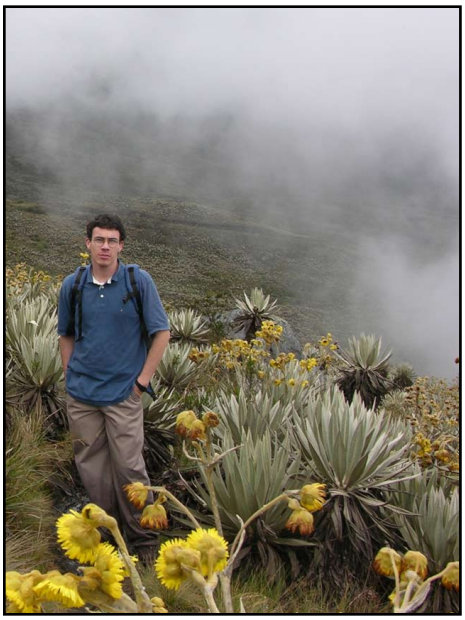


The leaf morphotype GD5 from the Guaduas Formation of the Late Cretaceous of Colombia is the focus of Camila Martínez Aguillón's research.

based on approximately 320 species previously sampled to construct the molecular phylogeny. She started the evaluation of the genus *Piper* with the paleotropical clades and then she continued with the less representative clades. Once the description of the leaves is completed and the taxonomic affinity of the fossil is established, she will calibrate the phylogeny of the genus and try to elucidate the origin and the migration of the genus.

Carlos Alonso Maya Lastra, a graduate student from Universidad del Quindío, Colombia, conducted studies on the taxonomy of the genus *Dalechampia* (Euphorbiaceae). He analyzed more than 600 collections of *Dalechampia* from the Neotropics and 57 specimens from Colombia. Overall, he has studied 320 collection of *Dalechapia* for Colombia from 13 different herbaria, with the material from US corresponding to 15.2 percent of the total sample, which covers a large time span contributing greatly to his work. Through the study of general collections and types he was been able to clarify numerous species concepts and understand their distributional patterns and morphological variation. Maya Lastra was able to uncover collections representing undescribed species and verify new synonymy and range extensions. He also benefited from using the large collections of literature housed in the Botany Library.

Maria Alejandra Jaramillo, from Universidad Icesi, Cali, Colombia, conducted research on the "Geographic Differentiation of *Piper* Species Complexes



Carlos Alonso Maya Lastra

Maria Alejandra Jaramillo

along the Chocó Region and Central America." She examined herbarium specimens, including several type specimens, as well as consulted the library and made copies of protologs of all species and their synonyms. She compiled a database with all specimens belonging to the *Piper trianae* (Piperaceae) complex. The database includes geographic information for 350 entries—of which the data will be used to produce distribution maps and predicted localities that need to be visited for a through sampling. A portion of leaf tissue was taken from selected specimens (with permission) to include in future molecular phylogenetic analyses. Many species of this complex are only known from the type collection. In particular a number of them correspond to collections made by José Cuatrecasas during his expeditions in Valle del Cauca, Colombia. Type specimens of nine of the 16 species of the complex are at US. Jaramillo also examined specimens of other clades of *Piper*, i.e. *Ottonia* and *Enckea*. She was able to identify at least two new species, one from Ecuador (a very distinct taxon of the *Peltobryon* clade with peltate leaves) and another from Guyana, belonging to the *Ottonia* clade.

From 16 September to 2 October, **Ana Isabel Vásquez-Vélez**, from Universidad del Valle, Cali, Valle del Cauca, Colombia, studied 70 species of *Pilea* Lindl. (Urticaceae), 25 of which are distributed in Central America and 45 in South America. These included 91 types, 29 of which are from Central America and 62 from South America, including 31 from Colombia. She built a database recording numerous morphological characters that are useful in the classification of the genus. These include length of masculine and feminine inflorescences, flower size, number of tepals, size of flower clusters, fruit size; size and shape of leaf cystoliths; stipule size; and presence or absence of pubescence. In total, she was able to study and identify about 200 specimens of Neotropical *Pilea*.

The dissertation objectives of **José D. Zúñiga**, from the Rancho Santa Ana Botanic Garden and Claremont Graduate University, include phylogenetic studies within Sabiaceae and *Meliosma*, as well as taxonomic work on Neotropical *Meliosma.* The Cuatrecasas Fellowship allowed him to study the morphological variation of vegetative and reproductive characters in *Meliosma*, with focus on subgenus *Meliosma* sect. *Lorenzanea*, and to study the type collections of Sabiaceae. Zúñiga studied over 30 type specimens of Neotropical *Meliosma* and three belonging to *Ophiocaryon* species. Notes and measurements on reproductive and vegetative morphological features were made for each specimen. When present, flowers were rehydrated and dissected with a light microscope (with previous consent from herbarium staff) to document with detail floral morphological characters that are of taxonomic importance in these two genera. He gathered label data from type specimens and general collection specimens. This data is already being used to inform future field work. He also annotated the specimens of Central American *Meliosma*.

Ana Isabel Vásquez-Vélez

An Odyssey of Knowledge

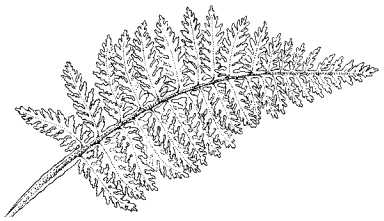
"An Odyssey of Knowledge – Medieval Manuscripts and Early Printed Books from the National Library of Medicine" <http://www.nlm.nih.gov/exhibition/odysseyofknowledge/index.html> is an online exhibition produced by **Alain Touwaide** and the National Library of Medicine in Bethesda, Maryland. The website examines how medical science took root in Southern Europe, was absorbed and modified by local medical practice and knowledge, and spread into the hinterland and beyond. It shows how European medicine is the result of the confluence of different streams of thoughts – from classical antiquity to pre-modern science, from Greece to Western Europe, and from discoveries based on reason to those rooted in tradition and experience.

Orchids – A View from the East

The 17th Annual Orchid Show titled "Orchids – A View from the East" will be on display 29 January to 24 April 2011 at the National Museum of Natural History (NMNH) in the Special Exhibits Gallery off the Museum's first floor Rotunda. This exhibit is hosted by NMNH and a joint presentation of Smithsonian Gardens (formerly the SI Horticulture Division) and the U.S. Botanic Garden. It explores the cultural impact of orchids with a particular focus on China. Orchids have historically been an influential part of Chinese life, which is well documented through their prominence in art, literature, and legends. They have long served as social status symbols and been consumed in teas and medicines.

A circular moon gate, iconic of Chinese gardens, provides entryway to the show. Visitors are then free to explore displays featuring live plants in a variety of settings ranging from scholar's and tea rooms, to a scholar's garden, and a orchid competition with interactive plant judging. Cultural artifacts interspersed among the plants include 18th–19th century Chinese scrolls depicting orchids (reproduced from SI holdings at the Freer & Arthur M. Sackler Galleries of Asian art) and a large scholar's stone on loan from the National Bonsai & Penjing Museum (U.S. National Arboretum). Orchids are also highlighted in relation to contemporary Asian culture. Visitors will gain an appreciation for the importance of conservation measures needed to protect economically important native species, as well as the thriving horticulture industry in Taiwan, which is known for its world-class orchid breeding and international orchid show.

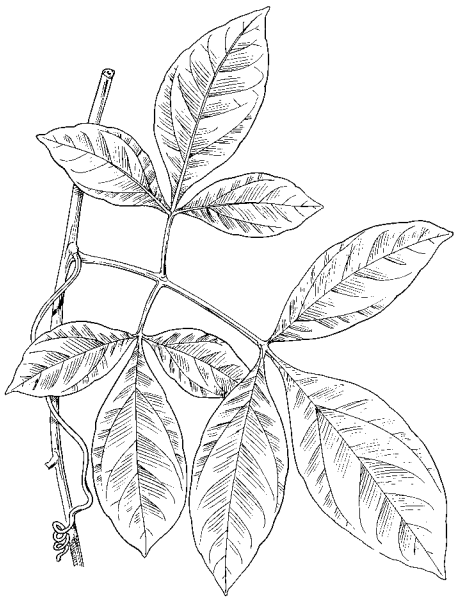
Ken Wurdack and **Jun Wen** worked with Exhibit Developer Siobhan Starrs to develop the scientific content of the exhibit script. The SI Gardens' Greenhouse Nursery Operations, which care for a collection of over 8000 orchids, moved during summer 2010 from the Armed Forces Retirement Home (known as the "Old Soldier's Home") to the Museum Support Center (MSC) grounds, close to the Botany research greenhouses. More information on the exhibit can be found online at http://www.mnh.si.edu/exhibits/orchids/index.html.



Flora of the Guianas Board Meeting Takes Place at NMNH

The consortium for the Flora of the Guianas whose goal is to promote and disseminate the botanical knowledge of the three Guianas (Guyana, Suriname, and French Guiana) met at the National Museum of Natural History during 4-5 November 2010 to discuss the advances made during the last two years. This consortium includes the participation of: 1) Botanical Garden and Museum in Berlin (B); 2) Institut de Recherche pour le Développement, IRD, Cayenne (CAY); 3) University of Guyana, Georgetown (BRG); 4) Royal Botanic Gardens, Kew (K); 5) Nationaal Herbarium Nederland, Leiden (L); 6) New York Botanical Garden, New York (NY); 7) Nationaal Herbarium, University of Suriname, Paramaribo (BBS); 8) Muséum National d'Histoire Naturelle, Paris (P); and 9) Department of Botany, Smithsonian Institution, Washington, D.C (US).

The meetings were planned by **Pedro Acevedo**, and included a one–day business meeting by the board, and a one-day workshop where the following talks were presented: 1) "Using Biodiversity and Systematics to Understand Evolution on the Guiana Shield," by **Vicki Funk** (US); 2) Progress Towards a Floristic Inventory of the Coastal Savannas of French Guiana," by Piero G. Delprete (CAY); 3) "The Grammitid Ferns of the Guianas," by **Carol Kelloff** (US); 4) "A Tale of Two Hybrids: Systematics, Biogeography and Diversity of Caesalpinioid Legumes of the Guiana Shield," by **Karen Redden** (University of DC); 5) "Taxonomic Novelties in a Few Families and Affinities of the Guiana Shield Species," by **Christian Feuillet** (US); 6) "*Myrcia s.l.* (*Myrcia*, *Calyptranthes* and *Marlierea*) in the Guiana Shield – Taxonomy, Conservation, the Last Decades and the Future," by Eve Lucas (K); 7) "e-Flora of the Osa Peninsula: A Model for an e-Flora of the Guianas," by Scott Mori (NY); 8) "Linnaeus and the Flora of the Guianas," by **Laurence Dorr** (US); 9) "What Makes a Plant Magic: Symbolism and Sacred Herbs in Suriname," by Tinde van Andel (L). A few posters were also presented during the workshop section.



Profile

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the Mount View Mission of Seventh-day Adventists "near Mt. Tulameng" where "at the edge of a very large savannah one can see for miles around, hemmed in by high mountains on every side" (from

***Parkia pendula* (Fabaceae) along Cara Creek. Pendulous inflorescences visited by bees. (Photo by Ken Wurdack).**

Davis, O. E. [F. M. Wilcox, ed.]. 1911. Jottings from Elder O. E. Davis's Diary. *The Advent Review and Sabbath Herald* 88(45): 15-17). Topographic map coverage (1:50,000. 1975. Survey Department of Guyana) based on aerial photography of 1962–1970 indicates Mount Tulameng has a peak of 1,539 meters close to a large unmapped region that was obscured by cloud coverage. Using these maps an expedition route was planned, although hypothetical idealized plans quickly give way to on-the-ground realities in jungle environments. It should be noted that the popular Guyana travel map (The Guianas and Guyana, International Travel Maps) mislabels the Chinakuruk/Eboropu Mountain complex as Tulameng.

BDG expeditions to this area jointly lead by Karen Redden and Kenneth Wurdack include one in the summer 2010 and another in May 2009 which also sought to reach Tulameng. Low water levels made it impossible to ascend Cara Creek to get close to the mountain during 2009 and instead the expedition continued up the Kako River to a major impassable falls. That trip yielded 741 numbers in the upper Kako region, including on Chinakuruk/Eboropu.

Rounding out the team of eight on the 2010 trip were Claudius Perry (Wapishana parataxonomist and long-time guide to Smithsonian researchers), Delph Hunter (boat captain), Virgil Roland (local guide from Kako Village), Hondel Hunter, Carlos Jacobis, and Sara Alexander (Masters' student and BDG Program employee). The 2010 expedition was timed to be later in the rainy season for higher water, and although water levels daily fluctuated greatly, the two wooden expedition boats could navigate Cara Creek with moderate log clearing and portaging rocky shallows to allow the team to establish a base camp approximately 11 air kilometers from the summit of Tulameng.

From the base camp two sequential forward camps were made on the mountain slopes by backpacking in supplies, including provisions, fuel, rain tarps, and collecting supplies (alcohol, newspapers, pruning poles, climbing spikes). The second camp along a small rocky creek rich in epiphytes and lithophytes was where daily hiking trips went out to collect and cut line along the mountain. The higher altitudes had montane cloud forest indicator species such as *Bonnetia* (Bonnetiaceae), *Podocarpus* (Podocarpaceae), *Schefflera* (Araliaceae), *Weinmannia* (Cunoniaceae), and *Miconia superba* (Melastomataceae), while wet areas at mid-elevations

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The expedition team in upland savanna. Back (left to right): Delph Hunter, Hondel Hunter, Karen Redden, Sara Alexander, Kenneth Wurdack. Front: Claudius Perry with pruning poles, Carlos Jacobis. Virgil Roland not pictured. (Photo by local guide)

Field pressing collections from the foreground sandy island (dominated by Cyperaceae, Poaceae, and *Xyris*) in upper Cara Creek; *Rondonanthus* on submerged sandstone rocks. Team members with boat Delf Hunter (by motor), Virgil Roland, Karen Redden, Carlos Jacobis (in stream), and Hondel Hunter (stern). (Photo by Ken Wurdack).

Profile

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had dense stands of *Micrandra glabra* (Euphorbiaceae). A spectacular waterfall estimated to be nearly 50 meters high had a bare rock splash basin. The surrounding vegetation transitioned in a short distance from damp herbaceous ground cover rich in grasses and rushes, to elfin forest twisted back from the constant cold misty wind the waterfall generated, back to full-height slope rainforest.

The area surrounding the falls and climb down to the falls yielded 50 numbers. While the expedition only covered a small portion of the mountain, the map shows a deep gorge on the south side, probable additional major waterfalls, and a summit needing greater exploration. Boat days along Cara Creek and the Kako River were rich in flowering collections, which was a pleasant surprise given uncertainty in phenologies during the poorly collected rainy season.

Wildlife also brightened the trip. Along watercourses, iridescent Morpho butterflies, bright blue dragonflies, kingfishers, toucans, and macaws were seen.

The team visited several savannas with *Stegolepis* (Rapateaceae) and *Brocchinia* (Bromeliaceae) along the Kako and at Imbaimadai. Imbaimadai itself has been a classic botanical locality since the 1950s (type locality for a number of Guiana Shield endemics) that remains remarkable for its rich savanna (although over burned and grazed by cattle) and forest plant diversity, ease of access at less than two hours by regular flight from Georgetown, hospitable inhabitants, and picturesque views. By the end of the expedition, the team had pushed the botanical frontier and had also achieved their goal of collecting 800 numbers and several thousand specimens.

The Redden and Wurdack trips (see also *Plant Press*, vol. 12, no. 1, 2009) have encompassed over 6 months in Guyana and yielded over 3,700 numbers, as well as silica-gel dried material for DNA analysis for over two-thirds of these collections. New species have already been described from these collections and new records discovered, but a full accounting of trip results especially for the more recent collections awaits the work of specialists to whom many specimens are distributed for identifications.

For more information about these and other BDG sponsored expeditions please see the BDG website <http://botany.si.edu/BDG/index.html>, which includes their collections and trip photographs geo-referenced using Google Maps. The

***Rondonanthus capillaceus* (Eriocaulaceae) on rocks in Cara Creek. (Photo by Ken Wurdack).**

Unnamed waterfall on eastern slope of Mount Tulameng. Team members (left to right) Carlos Jacobis, Sara Alexander, Karen Redden. (Photo by Ken Wurdack).

Biological Diversity of the Guiana Shield Program (BDG) has been operating from the National Museum of Natural History since 1983 and is a regular sponsor of biological expeditions.

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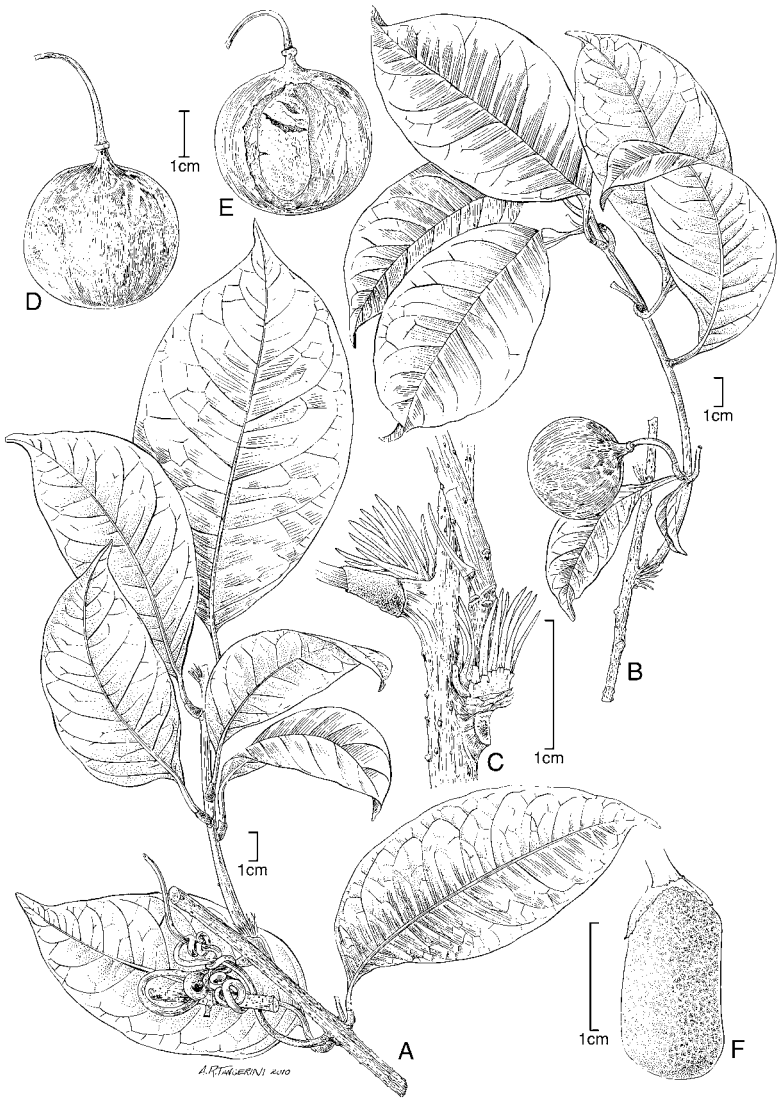
Art by Alice Tangerini

Dilkea clarkei Feuillet

Dilkea clarkei Feuillet (Passifloraceae) was collected by David Clarke in 1996 on the Kamoa Mountains and on the Makawatta Massif in southwest Guyana. It differs from others species of subgenus *Dilkea* by the combination of small elliptic leaf blades and spherical fruits neither hard apiculate nor tapering at base. Clarke was the eighth and final full-time Resident Plant Collector to participate in a collecting expedition sponsored by the Biological Diversity of the Guiana Shield Program.



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