

The Plant Press



Smithsonian
National Museum of Natural History

Special Symposium Issue - see page 10

New Series - Vol. 11 - No. 3

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Botany Profile

It Takes Two: Understanding Coevolution

By Gary A. Krupnick

The Seventh Annual Smithsonian Botanical Symposium, held on 26 April at the National Museum of Natural History in Washington, DC, gave 175 participants the opportunity to discover how natural selection has shaped animals and plants together through their ancient and persistent dependencies with one another. The theme, "Partners in Evolution: Interactions, Adaptations, and Speciation," was explored by a distinguished group of specialist speakers, and was highlighted with a reception in a pavilion of live plants and butterflies.

The meeting, held in collaboration with the United States Botanic Garden and the National Tropical Botanical Garden, was the first Smithsonian Botanical Symposium to be co-hosted by three departments from the museum—the Departments of Botany, Entomology and Paleobiology. The symposium addressed the various ecological interactions, evolutionary adaptations, and co-radiations of plants and animals in habitats across the planet and explored the processes of coevolution.

Giving the introductory greeting, Warren Wagner, symposium convener, welcomed the audience to Baird Auditorium. Hans-Dieter Sues, Associate Director for Research and Collections, then had the opportunity to say a few words about the museum's role in hosting symposia, before he trotted off to a concurrent symposium elsewhere in the museum.

Laurence Dorr took the stage to award the Seventh José Cuatrecasas Medal for Excellence in Tropical Botany to

Mireya D. Correa A. from the University of Panama and the Smithsonian Tropical Research Institute (STRI). An expert in the systematics of vascular plants with special emphasis on the Flora of Panama, Correa expressed gratitude and was highly honored. She recalled having wonderful conversations in the past with Cuatrecasas during her first visit to the U.S. National Herbarium. Very humble, Correa stated that she had "done what I have to do in a country very rich in species of plants." Correa thanked her large group of students, many who have worked with her in the field and in the herbarium. Of her students, Correa said, "[they] do what I cannot do – they climb, and I can think and teach." She also thanked STRI for presenting her with opportunities and support to do research that she would not have been able to accomplish at the university.

The first lecture of the day, moderated by the morning session chair Terry Erwin (Chair of Entomology, Smithsonian Institution), was presented by Judith Bronstein, Professor at the University of Arizona and current Program Director at the National Science Foundation, who spoke about "Mutualism, Diversity, and Diversification." Bronstein, who chose to "paint issues with a broad brush," spoke about the many benefits of mutualism: protection, nutrition, and transportation (e.g., pollination). She explained how mutualisms are maintained. Biologists

have often assumed that mutualisms are evolutionarily fragile, but new evidence (both models and phylogenetic studies) points to the remarkable robustness of mutualism in the face of ecological cheating.

Bronstein also discussed how anthropogenic change threatens biological diversity worldwide. Conservation strategies typically focus on individual charismatic

species, but management approaches should include mutualists as well. Current threats that disrupt mutualisms include (1) invasive species that outcompete mutualists, (2) habitat fragmentation that preclude mutualists from moving between patches, and (3) other disturbances, such as fire and hurricanes. The ultimate threat is coextinction, when one partner is lost due to the loss of the other partner; but Bronstein explained that there is very little evidence of coextinction, most likely because they are very difficult to detect.

Conrad Labandeira, Research Scientist, Curator and Chair of the Department of Paleobiology, Smithsonian Institution, asked the symposium participants "What Can We Learn from the Fossil Record of Plant-Insect Associations?" The fossil record of plants, insects, and their associations is evident in fossilized plant damage, coprolites (fecal remains that include plant parts), gut contents, and



Smithsonian
Botanical Symposium

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Pedro Acevedo traveled to Paramaribo, Surinam (6/8 – 6/22) to present a talk about Sapindaceae in the Guianas at the annual meeting of the Association of Tropical Biology and Conservation and to visit the Kabalebo Nature Reserve to explore the possibilities of conducting botanical explorations in that area of the country.

Walter Adey traveled to Lexington, Virginia (4/1 – 4/3) to present a talk on Algal Turf Scrubber (ATS) wastewater treatment and biofuel production capabilities at the Biofuels Conference sponsored the Chesapeake Bay Commission; to Harrisburg, Pennsylvania (4/16 – 4/17) to make a presentation to the State of Pennsylvania Deputy Secretary and staff concerning the ATS project; to Norfolk, Virginia (5/8 – 5/9) to give a talk at Old Dominion University; to Kennett Square, Pennsylvania (5/29 – 5/30) to give a presentation to the environmental staff of Exelon Corporation; to Holtwood, Pennsylvania (6/4 – 6/5; 6/10 – 6/11) to meet with ATS experimental unit staff at the Muddy Run Hydroelectric Plant; and to Kalamazoo, Michigan (6/18 – 6/19) to meet with ATS project staff chemists at Western Michigan University.

Maria Faust traveled to Carrie Bow Cay, Belize (4/23 – 5/8) to conduct field research on harmful dinoflagellates.

Vicki Funk traveled to Paramaribo, Surinam (6/8 – 6/14) to deliver the plenary address about the biodiversity of the Guiana Shield at the annual meeting of the Association of Tropical Biology and Conservation; to Minneapolis, Minnesota (6/21 – 6/25) to attend and to represent the Society for Systematic Biologists at the Evolution 2008 meeting; and to Vienna, Austria (6/27 – 7/2) to work with Tod Stuessy and Franz Stadler on the soon to be completed book on the Compositae titled *Systematics, Evolution, and Biogeography of the Compositae*.

W. John Kress traveled to Bronx, New York (5/1 – 5/3) to attend a workshop at the New York Botanical Garden called TREEBoL about DNA barcoding the trees of the world; to Paramaribo, Surinam (6/8 – 6/14) as Executive Director to attend the annual meeting of the Association of Tropical Biology and Conservation.

Mark and Diane Littler traveled to Fort Pierce, Florida (6/3 – 7/31) to conduct field research.

Rusty Russell traveled to Durham, North Carolina (6/2 – 6/4) to attend the 49th Annual Meeting of the Society for Economic Botany; and to Riverside, California (6/12 – 6/29) to investigate historic collecting localities in the San Jacinto Mountains and to attempt to locate plant species that had not been collected in more than 50 years, with an Earthwatch team composed of high school students recruited from around the country.

Robert Soreng traveled to Corvallis,

Oregon (6/10 – 6/13) to identify 1,700 Oregon State University *Poa* collections for the Oregon Flora Project; and then to Logan, Utah (6/16 – 6/17) to give a talk and verify grass specimens cultivated by USDA-ARS from recent seed collections in China, Kyrgyzstan, and Russia.

Alain Touwaide and Emanuela Appetiti traveled to Chicago, Illinois (4/3 – 4/6) to attend the annual meeting of the Renaissance Society of America; to Rochester, New York (4/10 – 4/13) to attend the annual meeting of the American Association for the History of Medicine; to Ankara, Turkey (5/12 – 6/8) where Touwaide delivered lectures at Bilkent University and the American Research Institute in Turkey and a plenary lecture at the first international meeting of the Turkish Society for the History of Medicine; and to Charlottesville, Virginia (6/20) where Appetiti delivered a lecture at the Kluge-Ruhe Center for Aboriginal Art, University of Virginia.

Jun Wen traveled to Sulawesi and Java, Indonesia (4/26 – 6/2) to conduct field work on Sulawesi plant diversity and *Prunus* taxonomy; and to Moscow, Russia (6/23 – 7/8) to give a presentation at the Apiales VI Symposium at Moscow State University and to go on a field trip to the Russian Caucasus region.

Liz Zimmer traveled to Minneapolis, Minnesota (6/20 – 6/23) to attend the Evolution 2008 meeting and an editor's meeting for the journal *Molecular Phylogenetics and Evolution*.



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Chair of Botany

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Visitors

Lei Xie, Chinese Academy of Sciences; *Clematis* (Ranunculaceae), and *Circaea* and *Fuchsia* (Onagraceae) (1/1/07-12/31/08).

Mauricio Bonifacino, Universidad de la Republica, Montevideo, Uruguay; Compositae (2/1/07-6/1/08).

Yunjuan Zuo, Beijing Institute of Botany, China; *Panax* (Araliaceae) (5/7/07-9/6/08).

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

Diane Pavak, U.S. Department of Agriculture; Mid-Atlantic flora (7/16/07-6/16/08).

Blanca Leon, Universidad Nacional Mayor de San Marcos, Lima, Peru; Peruvian *Tillandsia* (Bromeliaceae) and flora (10/18/07-10/18/09).

Marina Cortes, Columbia University; *Heliconia* (2/1-5/30).

Lu Jin-Mei, Kunming Institute of Botany, China; *Adiantum* (Adiantaceae) (2/1/08-1/31/09).

Rong Li, Kunming Institute of Botany, China; *Schefflera* (Araliaceae) (2/15/08-2/14/09).

John Cotton, George Washington University; *Historia Plantarum* collection (2/19-5/16).

Welcome Home, Director

In July 2008 Cristián Samper rejoined the National Museum of Natural History after serving for the past 15 months as Acting Secretary of the Smithsonian Institution. In 2007 he was asked to step in when the previous Secretary, Lawrence Small, suddenly resigned after the exposure of a host of problems concerning spending and leadership at the Institution. Samper's appointment as Acting Secretary was greeted with great relief by most Smithsonian staff members although many from NMNH were afraid that initiatives at NMNH would stagnate in his absence.

Samper served as the Acting Secretary of the Smith-



Cristián Samper showing his botanical roots in Guyana. (Photo by Vicki Funk)

sonian from March 2007 through June 2008. As Acting Secretary, he guided the Institution through a transition period, working with the Board of Regents on comprehensive governance review and reform, as well as enhanced communications with key stakeholders. He worked with Congress to address the funding need for facilities; initiated the planning for the Institution's first national fundraising campaign; restructured and refocused Smithsonian Enterprises (formerly Smithsonian Business Ventures); and oversaw the work of a new leadership team. He also communicated extensively with Smithsonian staff at town hall meetings. The extended interactions and transparency in his leadership has led to the highest morale within the institution in the 20 years I have been part of the staff. We all express our thanks to Cristián, who served with great distinction as Acting Secretary. He willingly stepped in during a challenging time for the Smithsonian, brought transparency where there had been obfuscation, and helped restore staff morale and the public's trust. Cristián's leadership came at a crucial point and we are all grateful to him.

Now he has returned to his position as Director of the NMNH filled with enthusiasm and new skills to address the opportunities and challenges we face here. We are delighted to welcome him back!

Chair

With

A

View

**Warren
L.
Wagner**



Silvia Nicolè, University of Padova-Agripolis, Italy; Plant DNA barcoding (3/3-8/31).

Kathryn Mauz, University of Arizona; Arizona historical and C.G. Pringle collections (3/31-4/4).

Alexandra Avila and Tracey Slotta, Hood College; Malvaceae (4/4).

Melissa Islam, University of Colorado; Erythroxylaceae (4/8).

Robert Urtecho, College of the Sequoias; *Tragia* (Euphorbiaceae) (4/10-4/11).

Gerald (Stinger) Guala, U.S. Department of Agriculture, Louisiana; Collaboration (4/11-4/12).

Diego Giraldo Canas, Universidad Nacional de Colombia, Bogota; Poaceae, Chloridoideae (4/20-5/26).

Lynn Bohs, University of Utah; *Solanum* (Solanaceae) (4/24-4/27).

Maria Stapf, Smithsonian Tropical Research Institute; *Cordia* (Boraginaceae), (4/24-4/25).

Konstantyn Romaschenko, National

Academy of Science of Ukraine, Kiev; Poaceae, Stipeae (4/25-6/30).

Sian Frith, Judith Fryer, Margaret Schepp, Michelle Villeneuve, and Barbara Young, Earthwatch Institute; Plants and People through the Ages (4/28-5/2).

Ted Hoff, Earthwatch Institute; Useful Plants of the Pacific Islands (4/28-5/2).

John Skvarla, Robert Bebb Herbarium, University of Oklahoma; Compositae (4/28-4/29).

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Staff Research & Activities

On 24 May, **John Kress** presented an on-screen tour of ethnobotanist Richard Evans Schultes' photographs of the Amazon region of Colombia during the 1940s and 1950s, during a lecture at the National Museum of Natural History. The photographs are currently on view in the related exhibition "The Lost Amazon: The Photographic Journey of Legendary Botanist Richard Evans Schultes," which runs through 2 November. Kress was a student of Schultes, and in the lecture he provided a behind-the-scenes look at how the exhibit was created and how Schultes was an influence on his own career as a botanist and explorer. The lecture is available online at http://www.mnh.si.edu/lectures/lost_amazon/.

Gary Krupnick presented the talk "Plant Conservation: A Natural History Approach" at the 1 April meeting of the Botanical Society of Washington.

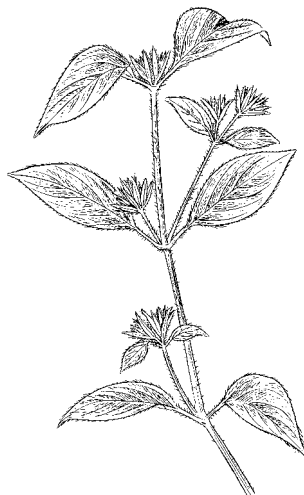
Diane and **Mark Littler** along with co-author M. Dennis Hanisak presented an overview of their recently published book *Submersed Plants of the Indian River Lagoon: A Floristic Inventory and Field Guide* as part of the summer Ocean Science Lecture Series at Harbor Branch Oceanographic Institute at Florida Atlantic University, 8 June. The public presentation featured rich photography and illustrations depicting the taxonomy and distributional patterns of more than 250 species of submersed plants in the 156 mile-long Indian River Lagoon. The book was based on six years of field and laboratory work along the central coast of Florida, where biodiversity is augmented by currents from four major biogeographical provinces resulting in the most diverse estuary system in the continental US.

Alice Tangerini continued her afternoon botanical sketching workshops at the National Museum of American Art as part of the "Draw and Discover" series organized by the Luce Foundation for American Art. The sessions were held every third Tuesday, March through May. NMAA provided drawing media and

chairs so all of the artists could choose their favorite spot to sketch the herbaceous plants and trees in the planted areas of the museum's Kogod Courtyard. Tangerini gave a 15-minute demonstration at the beginning and ended the sessions with a show and tell critique. The sketching sessions were well attended and several attendees returned every month.

On Saturday, 14 June, Tangerini, along with four other members of the Botanical Art Society of the National Capitol Region (BASNCR) presented drawing and painting sessions as part of the Pollinators Family Day at the U.S. Botanical Garden. Tangerini provided sketches of heliconias and hummingbirds for children to color and other members provided various other pollinator-plant images for sketching and craft making.

On 19 April, **Alain Touwaide** delivered the talk "Leafing through History: An Imaginary Walk through and Ancient Library" in Washington, DC, at the History and Pedagogy of Mathematics Symposium organized by the Mathematical Association of America (MAA).



Awards & Grants

In 2003, the National Museum of Natural History began awarding Science Achievement Awards, recognizing exceptional scientific publications in natural history. A maximum of five awards are made in any one calendar year. In close consultation with the Senate of Scientists, an interdisciplinary review committee honored five scientists for their outstanding work this year. Among the 2008 Science Achievement Award winners is **Warren Wagner**

for his paper "Revised Classification of the Onagraceae" (*Systematic Botany Monographs* 83: 1-240; 2007).

Dan Nicolson was recognized as the annual Distinguished Speaker by the New England Botanical Club. In honor of the recognition, Nicolson gave a lecture "My Beautiful Life" at Harvard University on 4 April.

Nicolson also received the "Award for Distinguished Career in Science" by the Washington Academy of Sciences during the Academy's annual banquet, held on 6 May at Meadowlark Botanical Gardens in Vienna, Virginia. The award certificate that Nicolson received reads "In recognition of his towering accomplishment as a taxonomic botanist and particularly his expertise in the arcane subject of botanical nomenclature." As an awardee, Nicolson automatically became a fellow of the Academy. The presenter and nominator was Emeritus Curator **Stanwyn Shetler**, endorsed by **Alain Touwaide**, immediate Past-President of the Academy. Shetler and Touwaide themselves were awarded for their scientific contribution by the Academy in 2002 and 2003, respectively. **Emanuela Appetiti** served as banquet committee chair, in charge of organizing the event, which also featured keynote speaker William Fitzhugh, Curator in the Department of Anthropology. Nicolson's wife Allie, son David, and daughter-in-law Tamar joined in the celebration.



Dan Nicolson

New Faces

In June **Andrew P. Clark** joined the permanent staff of the Core Collections Management Team. Andrew graduated from Towson University in May 2007, with a B.S. in Biology with a concentration in Botany. Following graduation he interned at the Adkins Arboretum on the Eastern Shore, followed by a long term appointment with Chesapeake Natives, Inc., based in College Park and funded by Americorps and Volunteer Maryland. At Towson Clark worked in the university herbarium and developed the skills that made him an excellent candidate for this position. He is also quite knowledgeable of the plants of the Chesapeake region and has worked at educating residents of the importance of preserving local diversity by incorporating native plants into home landscaping. Clark is currently working toward a Master's in Ecology and Environmental Physiology at the University of Maryland. His responsibilities in CCM will include oversight of shipping and receiving activities, acquisitions and the exchange program.



Andrew P. Clark

Robin Everly has joined Smithsonian Institution Libraries as the new Botany-Horticulture Librarian. Everly comes to the museum from the U.S. National Arboretum Library, where she had been at the library for the past six years. She was also a Technical Information Specialist/Database Indexer at the National Agricultural Library for 10 years. She has been a very active participant in the Council on Botanical and Horticultural Libraries. Aca-



Robin Everly

demically, Everly has a Masters in Library Sciences (M.L.S.) and a B.S. in Zoology from the University of Maryland.

Mark and Diane Littler are advising a Link Foundation Fellow, **Kyle Glenn**, a master's student from Moss Landing Marine Laboratories on Monterey Bay, California. Glenn is conducting research at the Smithsonian Marine Station at Fort Pierce, Florida, this summer on nutrient translocation in rhizophytic Bryopsidales.

Staff Departure

In May, **Marjorie Knowles**, museum specialist, left the Department to be closer to her family in New England and pursue her own personal endeavors. A staff member since 1987, Knowles had provided support for **Paul Peterson**, the collections management unit under **Rusty Russell**, and most recently as research assistant to **Harold Robinson**. Several of her accomplishments include the original digitization of the José Cuatrecasas monograph of the Espeletiinae during the time she lived in his home, and a large part of the editing and correcting of that manuscript that took place in the years that followed. She also served as herbarium technician for the Verbenaceae, Labiatae, Solanaceae and Asteraceae during the time she assisted Robinson. She updated the Asteraceae genus board, prepared the list of Cuatrecasas publications used in his obituary, did extensive SEM work, and proofread and prepared illustrations. She deferred on co-authorship of papers on which she worked, until the last paper, which was entomological.

Visitors

Continued from page 3

Tim Whitfeld, University of Minnesota; DNA barcoding (4/28-4/30).

Frances Hess, Ellen Isan, Marvin Isan, and John Kuiper, Earthwatch Institute; Plants and People through the Ages (5/5-5/9).

Walter Holmes, Baylor University; Central and South American *Mikania* (Compositae) (5/12-5/16).

Natalia Valderrama, Instituto Botanico, Bogota, Colombia; Digitization activities (5/19).

Janelle Burke, Cornell University; Polygonaceae (5/21-5/23).

Mauricio Diazgranados, University of Missouri and Missouri Botanical Garden; Compositae (5/21-6/7).

Alexandra Schellenger, Smith College; Collections management techniques (5/27-8/15).

Neil Brummitt, Royal Botanic Gardens, Kew; Herbarium work (5/28-5/30).

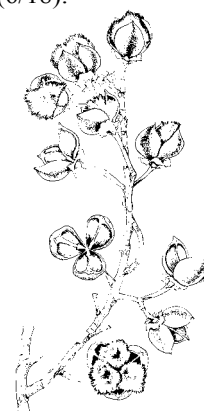
Ana Claudia Araujo, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil; *Scleria* (Cyperaceae) (5/29-5/30).

Jim Locklear, University of Nebraska State Museum; *Phlox* (Polemoniaceae) (6/4-6/5).

Cecily Marroquin, New Mexico State University; Medicinal Plants of Antiquity (6/16-8/15).

Kyle Palmquist, Chicago Botanic Garden; Mid-Atlantic flora (6/16).

Jaynie Louise Anderson, University of Melbourne, Australia; *Historia Plantarum* collection (6/18).



The Magnificence of Botany

On the evening of 9 May, photographer Jonathan Singer presented a gift of the first set of his work entitled *Botanica Magnifica* to the Department of Botany and the Smithsonian Institution Libraries. *Botanica Magnifica* consists of five volumes in a double elephant folio format, the same size and scope as the work produced by John James Audubon in his elegant *Birds of America* two hundred years ago. Each volume of *Botanica Magnifica* includes fifty photographs of scientifically identified species centered on the five themes of orchids, gingers, horticulture, plant form, and rare species. Together these five volumes encompass two hundred and fifty images, which comprise a distinctive representation of the world of plants. The inclusion of *Botanica Magnifica* in the Smithsonian Institution Libraries is a fitting addition to the collection of exceptional natural history volumes.

As stated in the temporary exhibit about *Botanica Magnifica* in the Constitution Avenue lobby to the Museum “*Botanica Magnifica* integrates art and science by dissolving the boundaries between our appreciation of Nature and our understanding of how Nature works. In his images photographer Jonathan Singer captures the essence of plant form, color, and texture thereby enhancing the viewer’s appreciation of the complexity of the botanical world.” In Singer’s own words “To see these photographic images is to transcend the medium and see the subject itself.”

Botanica Magnifica is the result of a close collaboration between photographer Singer and **John Kress**. Singer first approached Kress in the fall of 2006 about his desire and intention of producing *Botanica Magnifica*. Singer had already been working with horticulturist Marc Hachadourian of the New York Botanical Garden, but wanted a tropical botanist as a collaborator as well. Many artists want their work to be housed at the Smithsonian so Kress was cautious when he first met Singer at an off-site local gallery. However, when he saw the first images, which were the very beginnings of the work, Kress knew that this was a project that would be worth the effort. The rest of the story of the production of *Botanica Mag-*



Hedychium longicornutum Griff. ex Baker, from *Botanica Magnifica*, a five-volume folio of photographic art by photographer Jonathan M. Singer.

nifica can be found in an article in *Vanity Fair* written by Howard Kaplan.

The photographs in *Botanica Magnifica* were printed by Cathy and Jon Cone of Cone Editions Press in Vermont and bound by the well-known book binder Tini Miura of California, who was responsible for rebinding the set of Audubon books at the Smithsonian. *Botanica Magnifica* is now in place in the Culman Rare Book Library at the Smithsonian and can be seen by appointment.

Harmful Dinoflagellates Found on the Mesoamerican Barrier Reef Belize

Maria Faust and her research team, consisting of Patricia Tester, Michael Dowgiallo, David Johnson, Mark Vandersea, Steve Kibler and Chris Holland from the National Oceanic and Atmospheric Administration (NOAA) and Janelle Fleming from Seashore Coastal Consulting, discovered harmful dinoflagellates present in fore reef water during their April 2008 field sampling in Belize. Information on the taxonomy, biodiversity, and distribution of dinoflagellates, known producers of toxins and causing ciguatera fish poisoning (CFP), is limited. Currently, it is not

known whether CFP events are due to specific environmental triggers that increase toxin production, an increase in the abundance of more toxic species, or the combination of the two. Field studies in Belize focused on comparing habitat preferences and abundance of *Coolia*, *Gambierdiscus*, and *Ostreopsis* CFP-associated dinoflagellates in coral reef-mangrove cays in deep versus shallow water habitats and low versus high energy habitats.

The highlight of the trip was the discovery of *Gambierdiscus* species associated on macroalgal species at high energy habitats, at depths of 40-45 feet in Curlew Bank fore reef waters. During numerous dives during the week, the team additionally identified *Gambierdiscus* species on coral rubble and plastic screens in this unusual habitat. Quantitative analysis produces a clear picture of distribution of *Gambierdiscus*, which in turn translates into species identification, taxonomic and molecular analyses. The second important discovery which has not been observed since 1981 was that only *Ostreopsis* and *Gambierdiscus* CFP species were present in samples collected in coral reef-mangroves along 15 miles long gradient in the central lagoon of Belize. For example, six *Ostreopsis* species were identified attached to a nylon rope hanging from the dock at Carrie Bow Cay. On the other hand, other

dinoflagellate species were very low in numbers or absent in shallow waters, protected mangrove cays and seagrass beds. These data provide crucial information on the distribution and habitat preference of CFP dinoflagellates.



A 14-Month Study of *Chiliotrichum*

Mauricio Bonifacino came to the US National Herbarium from Montevideo, Uruguay, to conduct research on the systematics of *Chiliotrichum* group (Compositae: Astereae) through a postdoctoral fellowship granted by the Smithsonian Institution under the guidance of **Vicki Funk**. Before his arrival and during his time here, he was also involved in other projects.

Before he arrived, Bonifacino had conducted field work in Venezuela (October 2006) and along the southern Andes in Argentina and Chile (December 2006) to collect material for his research, though he also contributed to other research projects with no less than 400 specimens that have been incorporated to the US National Herbarium. He then spent a month at the New York Botanical Garden learning molecular techniques with Fabian Michelangeli, who served as his host and advisor.

He, as well as his wife Valerie and two sons (Joaquín and Juan Manuel), arrived in Washington, DC, at the end of January 2007, and he immediately set to work on molecular systematics of the *Chiliotrichum* group.

The *Chiliotrichum* group is an interesting assemblage of some 11 genera and 31 species of shrubby daisies that occur along the Andes from the sub-paramo in Colombia to Patagonia in Tierra del Fuego. This group of rather attractive plants can be easily recognized from other South American Compositae by its smooth (not ornamented) and paleate receptacles. In certain areas they can constitute the dominant element of the native vegetation.

Molecular work yielded sequences of two nuclear markers (ITS and ETS) and three chloroplast markers (trnL_F, rpl32F, and rpl16). Based on this information, but

also thanks to the use of several morphological traits, new hypothesis of relationships among the taxa comprising the *Chiliotrichum* group emerged and allowed Bonifacino to significantly improve the understanding of this conspicuous group of southern South American Compositae. These results have been and are in the process of being communicated in the form of three papers, two of which are in press (*Brittonia*; *Smithsonian Contributions to Botany*) and a third one is in preparation.

Bonifacino also collaborated with other colleagues of Argentina and Uruguay to produce a paper on *Asteropsis* (Compositae: Astereae), a contribution that addresses nomenclatural and systematic issues, and presents for the first time an illustration for this highly attractive Compositae from southern Brazil and northern Uruguay.

During the months of June and July 2007 Bonifacino participated as co-coordinator for the Tropical Plant Systematics Course organized by the Organization for Tropical Studies in Costa Rica. This was his sixth trip to work with OTS.

While in residence at Smithsonian, Bonifacino also started working on a paper in co-authorship with **Harold Robinson**, **Vicki Funk**, H. Walter Lack, and Gerhard Wagenitz on the influential figures in the history of Compositae systematics. This paper, to be published in the Compositae book that emerged from the Barcelona

meeting on Compositae systematics in 2006, deals with short biographical information on the most significant scientists and comments on their most important contributions to the field. Also as part of the Compositae book Bonifacino helped prepare quite a few of the photographic plates for the book and used a number of his own photographs.

Bonifacino had his work space in the office of the research assistant of **Warren Wagner**, and being in the realm of Pacific botany inevitably (and happily, Bonifacino says) resulted in a collaboration with a group of Pacific botanists on the biogeography of *Bidens* from the Pacific. Bonifacino contributed to this project by extracting DNA from several species, as well as obtaining sequences for several markers for some of them, and he will actively follow up on it from his home institution in Uruguay.

Valerie Bonifacino also became part of the Botany Department working for Warren Wagner as a part-time research assistant, specifically involved with the On-line Flora of the Marquesas project, to which she contributed significantly making available on-line descriptions for over 500 taxa.

The Bonifacino family returned to Montevideo in late May 2008 and recent emails indicate that they are busy getting settled back into their home. Bonifacino begins teaching at the University in July.



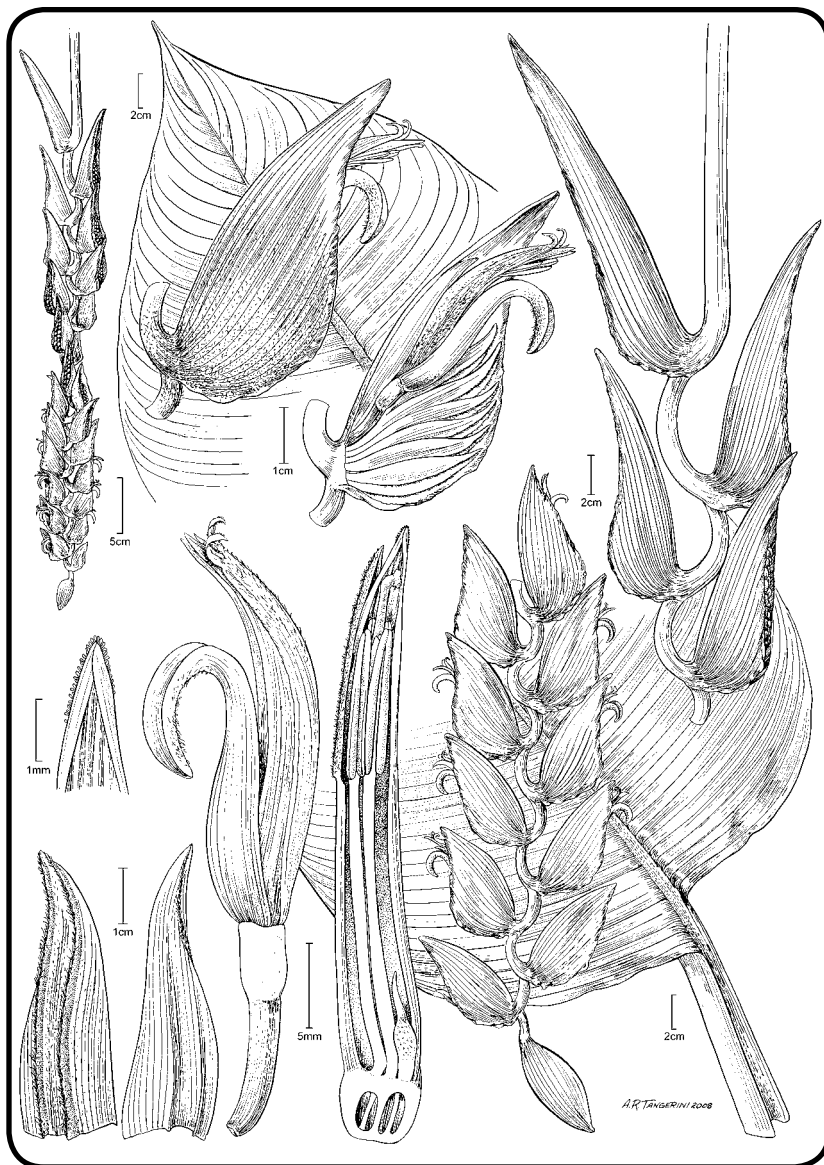
Mauricio Bonifacino

Samper Honored with Plant Names

As a tribute to the accomplishments of Cristián Samper during his term as Acting Secretary of the Smithsonian Institution, a genus and a new species were named in honor of him. **Vicki Funk** and **Harold Robinson** named a genus of Compositae after Samper in recognition of his service. The genus *Sampera* V.A. Funk & H. Rob. (Compositae: Liabeae) was previously the subgenus *Andromachiopsis* H. Rob. & Brettell (1974) in *Oligactis*. Molecular data have shown that this subgenus is not the sister group of the remaining species of the genus *Oligactis*. The new genus contains eight species of shrubs that have small heads without rays, and yellow flowers. It is distributed from Colombia south-

ward to northern Peru with the majority of species in Ecuador.

John Kress and his colleague Julio Betancur of the Herbario Nacional Colombiano in Bogotá named a new species of the tropical genus *Heliconia* in honor of Samper. Kress was asked by a committee planning a tribute for Samper if it would be appropriate to dedicate a species to him. "Of course," Kress replied, "and I have just the right plant!" *Heliconia samperiana* W.J. Kress & J. Betancur is a robust plant resembling a banana in appearance with a large bright red inflorescence. The species is known only from a very small area in the Chocó region of western Colombia. Kress and Betancur will be publishing the new species in a Colombian botanical journal to recognize Samper's contributions to the conservation of biodiversity in that country.



Heliconia samperiana W.J. Kress & J. Betancur

Looe Key National Marine Sanctuary

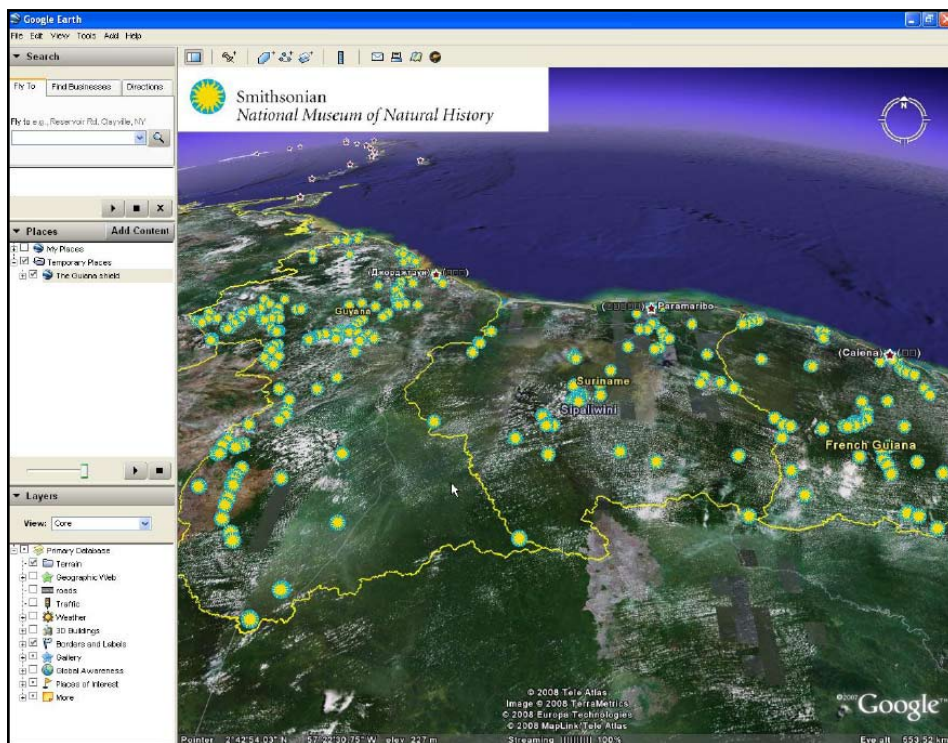
Mark and **Diane Littler** along with their summer intern **Kyle Glenn** conducted a 25-year follow-up survey of Looe Key National Marine Sanctuary off Big Pine Key, in the Florida Keys. Along with a collaborating team, lead by Brian E. Lapointe from Harbor Branch Oceanographic Institute at Florida Atlantic University, the group conducted water-quality surveys, fish counts, transects of distribution and abundance of algae and invertebrates and a detailed species inventory. These data will be used to compare with a similar study the Littlers and Lapointe did 25 years ago for the National Oceanic and Atmospheric Administration (NOAA).

The Looe Key National Marine Sanctuary is the most heavily visited coral-reef site in the continental United States with thousands of snorkelers and scuba divers every year impacting the resource. However, following the "no-take" ruling some 10 years ago the first impression is that the reef system is in relative good shape with abundant sea fans, brain coral, healthy diversity of algae and increases in herbivorous fish. The Littlers collected more than 300 specimens and are presently working up the species inventory at the Smithsonian Marine Station at Fort Pierce, Florida.

Georeferencing the Plants of the Guiana Shield

The project "Georeferencing Plants of the Guiana Shield: US Types," available at <http://botany.si.edu/bdg/georeferencing.cfm>, displays in Google Earth and Google Maps the geographical location of the plant types housed in the US National Herbarium. These specimens were originally collected on the Guiana Shield (northern South America) often by the Biological Diversity of the Guiana Shield Program (BDG) of the Smithsonian Institution. The project was developed by **Eduardo Garcia-Milagros**, **Vicki Funk**, and **Ellen Farr**.

All discovered and described species on Earth have an official name. In general, that name consists of a genus, a specific epithet, and the name of the person(s) who described it; all together these are called a



The type collections of plants from the Guiana Shield held at the Smithsonian Institution as displayed in Google Earth.

species name. Usually each species name is tied to a specimen that is housed in a collection that is stored in a herbarium in a museum, garden or university. These specimens are called types. Naming of plants is governed by the International Code of Botanical Nomenclature.

This Web site currently includes the type collections of plants collected on the Guiana Shield (in Guyana, Suriname, or French Guiana) and housed at the US National Herbarium (ca. 1400 specimens). Placemarks for the Venezuelan part of the Guiana Shield (ca. 1900 specimens) have just been uploaded; the state of Bolivar is expected to be available in July.

Users can view detailed information and images for the plant type specimens, display the specimens with coordinates on Google Maps, and download their Google Earth files. Google Earth must to be installed on the user's computer to open the kml files. Some tips on using Google Earth are also available on the Web site.



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Smithsonian Botanical Symposium

Correa Receives Seventh Cuatrecasas Medal

The Department of Botany and the United States National Herbarium present this annual award to a botanist and scholar of international stature who has contributed significantly to advancing the field of tropical botany. The José Cuatrecasas Medal for Excellence in Tropical Botany is named in honor of Dr. José Cuatrecasas (1903-1996), a pioneering botanist and taxonomist who spent nearly a half-century working in the Smithsonian Institution's Department of Botany. Cuatrecasas devoted his career to plant exploration in tropical South America, especially in Colombia, and this award serves to keep vibrant the accomplishments and memory of this outstanding scientist.

The winner of this prestigious award is selected by a committee made up of three botanists on the staff of the Department in consultation with other plant scientists outside of the Smithsonian Institution. Nominations for the Medal are accepted from all scientists in the Botany Department. The award consists of a bronze medal bearing an image of José Cuatrecasas on the front with the recipient's name and date of presentation on the back. Highlights from past presentations to the recipients are available at <http://botany.si.edu/cuatrecasas/cuatrecasasMedal.cfm>.

Mireya D. Correa A., of the University of Panama and the Smithsonian Tropical Research Institute (STRI), is the seventh recipient of the José Cuatrecasas Medal for Excellence in Tropical Botany. Correa's area of expertise is the systematics of vascular plants with special emphasis on the Flora of Panama. The award committee was impressed with her many accomplishments as educator, administrator and taxonomist. For close to four decades she has influenced students in her role as Professor of Botany at the University of Panama. She founded and has been director since its inception of the largest herbarium in Panama. She has

contributed to the botanical community nationally, regionally and internationally through service to numerous botanical and environmental organizations including the Organization for the Flora Neotropica.

The committee also took note of Correa's many contributions to scientific journals as well as several books published over the course of her career. Notable amongst these books are *The Botany and Natural History of Panama* (1985), *Catálogo de las Plantas Vasculares de Panamá* (2004) and a monograph of *Drosera* (Droseraceae) for *Flora Neotropica* (2005).

Correa received her B.A. from the University of Panama in 1963, and her M.A. from Duke University in 1967. In 1968, she founded the Herbarium of the University of Panama (PMA). Starting with no specimens, the collection now has almost 70,000 specimens of which some 12,000 were collected by Mireya. The herbarium is Panama's largest, holding approximately 1,500 types and 10,000 bryophytes and

lichens, in addition to a small collection of macrofungi. Currently, the herbarium is playing an important role in coordinating the LAPI (Latin American Plant Initiative) project funded by the Andrew W. Mellon Foundation which seeks to image Latin American type specimens. Not content to curate one herbarium, Mireya also curates the smaller herbarium of STRI that has some 12,000 specimens.

Correa's main research interest is to concentrate collection efforts in areas of Panama that have been ignored and might be rich in species diversity. She would like to survey these areas in order to have a better understanding of species distribution within Panama, including characterization of the species (i.e. endemic, endangered, rare, vulnerable). One important goal of hers is to document the plant species represented in several Panamanian national parks since such inventory is an important tool for the management plans of these parks.



Mireya Correa (center) receives the 2008 José Cuatrecasas Medal for Excellence in Tropical Botany from Laurence J. Dorr, Chair of the Award Committee (left), and Warren Wagner, Chair of the Department of Botany (right). (Photo by Thomas Matson)

Abstracts from the Speakers at the Smithsonian Botanical Symposium

The seventh annual Smithsonian Botanical Symposium was held 26 April 2008. The symposium, "Partners in Evolution: Interactions, Adaptations, and Speciation," explored the various ecological interactions, evolutionary adaptations, and co-radiations of plants and animals in habitats across the planet and addressed the processes of coevolution. Below are the speakers' abstracts from the papers that were presented.

Judith L. Bronstein

*University of Arizona, and
the National Science Foundation*

"Mutualism, Diversity, and Diversification"

Mutualisms (reciprocally beneficial interactions between pairs of species) appear to have played a central role in evolutionary processes of diversification on earth. In particular, the evolution of several critical symbiotic interactions appear to have spurred adaptive radiations in many taxa, plants prominent among them. At an ecological time scale, mutualisms generate and help maintain species diversity within communities and ecosystems. At the same time, however, species diversity is threatened by anthropogenic disruptions and dissolution of mutualisms, as well as by the extinction of critical mutualists. In this talk I will review ecological and evolutionary processes inherent to mutualism that both generate and deplete diversity. Conservation of mutualisms, I will argue, is a critical goal in a changing world.

Conrad C. Labandeira

Smithsonian Institution

"What Can We Learn from the Fossil Record of Plant-Insect Associations?"

The fossil record of insect-mediated damage on plant organs provides insight into the diversity, intricacy and timing of insect associations on past floras. The earliest instances of modern plant-insect associations occur during the Paleogene Period, 23 to 65.5 million years ago (Ma).



Hans-Dieter Sues, Associate Director for Research and Collections, and Warren L. Wagner, Chair of Botany, with the speakers of the 2008 Smithsonian Botanical Symposium. Left to right: Hans-Dieter Sues, Ted Schulz, Warren L. Wagner, W. John Kress, John N. Thompson, Scott Hodges, Judith L. Bronstein, and Conrad Labandeira. Missing Olle Pellmyr. (Photo by Donald Hurlbert)

The end-Cretaceous event, at 65.5 Ma, reset the clock for then-existing host-specialized associations that fully recovered during the early Eocene, approximately 10 million years later. This rebound began during the global rise in global temperatures and atmospheric CO₂ levels during a 10⁶ year-long interval, the Paleocene-Eocene Thermal Maximum, at 56 Ma.

There are two, major, Mesozoic insect-herbivore radiations. The more recent event, 105 to 90 Ma, coincides with the angiosperm radiation and consisted of external feeders, piercer-and-suckers, leaf miners, galls and ovipositing insects on basal dicots, including Magnoliales, Chloranthaceae, Laurales, Illiciaceae, Platanaceae and Cercidiphyllaceae. These associations frequently are attributable to extant insect clades, particularly coleopteran "Phytophaga," monoxylan Lepidoptera and symphytan Hymenoptera. An earlier and more extensive Late Triassic event occurred from 228 to 222 Ma by a diverse array of plant-insect associations that colonized a regional Gondwanan flora in South Africa's Karoo Basin. This event is represented by 78 distinctive types of insect mediated damage on the foliage and fructifications of peltasperm, corystosperm and ginkgooid seed ferns, cycads, voltzialean conifers, ferns, bennettitaleans, and horsetails. The earliest leaf mines originate

from this event, attributable to coleopteran and probably lepidopteran lineages.

The oldest, major herbivore diversification event occurs in coal-swamp floras during the late Paleozoic, at 303 Ma. Spectacularly preserved, three-dimensional, anatomical preservation of plant organs occur on marattialean tree ferns and medullosan seed ferns and on subdominant taxa such as herbaceous ferns, sigillarian lycopods and cordaites conifers. Insect culprits responsible for this plant damage include large paleodictyopteroids bearing stylate mouthparts, mandibulate orthopteroid groups, and endophytic, holometabolous larvae.

Olle Pellmyr

University of Idaho

"Coevolution and Obligate Mutualism: What We Are Learning from Yuccas and Yucca Moths"

Obligate mutualisms between seed-parasitic pollinators and their hosts are excellent models for understanding coevolutionary processes. Among the best understood at this time is arguably the interaction between yuccas and yucca moths. In recent years, a combination of ecological and evolutionary studies

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Abstracts

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addressing all partners of the association have unveiled much higher species and life history diversity among the pollinators than previously known and a broader range of outcomes of plant-pollinator interactions. Phylogenetic analyses now provide robust species-level phylogenetic frameworks for both plants and moths, permitting analyses to determine the role of codiversification, life history evolution, and coevolution in this interaction. By the time you read this, they will have been completed so that you can receive them hot off the press. I can't wait.

W. John Kress

Smithsonian Institution

Ethan J. Temeles

Amherst College

Vinita Gowda

*The George Washington University,
and Smithsonian Institution*

"From Generalization to Specialization... and Back Again in the Coevolutionary Mosaic of a *Heliconia*-Hummingbird Pollination System in the Eastern Caribbean"

The degree of specialization and interdependence between mutualistic species

Acknowledgements

The success of the Symposium was due to the significant time and efforts of the following people:

Organizers

- Laurence Dorr
- Ellen Farr
- Vicki Funk
- W. John Kress
- Gary Krupnick
- Conrad Labandeira
- Sue Lutz
- Ted Schultz
- Warren L. Wagner

Support

- Mary Ann Apicelli
- Patricia Davis
- Jamie Whitacre

Photographer

- Elaine Haug

And many others who had helped in a myriad number of ways.

varies in space and time. As stressed by John Thompson in his "Geographic Mosaic Theory of Coevolution" species interactions are neither ecologically nor evolutionarily static, but can change from place to place throughout the distribution of the interaction and from generation to generation of the evolving mutualists. The relationship between the tropical plant genus *Heliconia* and its hummingbird pollinators in the eastern arc of Caribbean islands is a striking example of this mosaic. Our investigations of this system using a geographic approach reveal the transition in a plant species from pollinator generalization to extreme specialization as well as the floral traits and pollinator characteristics that are associated with this shift from generalization to specialization across an island archipelago.

Scott Hodges

University of California at Santa Barbara

"Understanding Speciation and Adaptation to Pollinators: From Field to Genomic Studies of *Aquilegia*"

The flowering plant genus *Aquilegia* has undergone a very recent adaptive radiation, producing species adapted to specific pollinators and habitats. For an understanding of the process of adaptation to different pollinators, and whether this process promotes speciation, we have conducted an array of studies including field observations and experiments, analysis of mating patterns in hybrid zones, phylogenetic reconstruction and genetic analysis of floral traits. Manipulative studies have shown that single floral traits can have very strong impacts on pollinator visitation or pollen transfer. In hybrid zones, these same traits contribute to reproductive isolation by causing assortative mating. Genetic studies indicate that some of these traits are likely controlled by one or only a few genes. Taken together, these studies suggest that simple genetic changes can result in major changes in pollinators and promote speciation. Ultimately, our goal is to identify the genes and mutations underlying these traits. Currently we are developing genomic resources for *Aquilegia* such as an EST database, physical maps, and whole-genome sequencing. These resources will allow detailed genetic studies of the approximately 70 species of the genus and likely many close relatives.



Symposium speaker Olle Pellmyr.
(Photo by Elaine Haug)

Ted Schultz

Smithsonian Institution

"The Evolution of Agriculture in Ants: 50 Million Years of Symbiosis between Ants, Fungi, and Bacteria"

Agriculture is a specialized form of symbiosis that is known to have evolved in only four animal groups: humans, bark beetles, termites, and ants. Fungus-growing ants (tribe Attini, subfamily Myrmicinae) are perhaps the most well-studied of the non-human agriculturalists, achieving their evolutionary apex in the leaf-cutting ants of the genera *Acromyrmex* and *Atta*, which are the dominant herbivores of the New World tropics. Attine ant agriculture is the product of a 50-million-year-old, quadripartite, symbiotic relationship between three mutualists and one parasite. The mutualists include the attine ants, their fungal cultivars (Leucocoprineae and Pterulaceae), and filamentous bacteria in the genus *Pseudonocardia* (Actinomycetes) that grow on the integuments of the ants. The parasite, a fungus in the genus *Escovopsis* (Ascomycetes) known only from attine fungus gardens, infects those gardens as a "crop disease" and is controlled, at least in part, by an antibiotic produced by the *Pseudonocardia* bacte-

rial symbiont. Intensive study of the attine symbiosis during the past two decades, including phylogenetic analyses of all four symbionts, has revealed that attine agriculture can be divided into five distinct agricultural subsystems, each involving a phylogenetically distinct subset of associated symbionts.

John N. Thompson

University of California at Santa Cruz

“Coevolving Networks of Species”

Life has diversified not only into millions of species but also into hundreds of millions of interactions among species. In fact, no complex organism is able to survive and reproduce without interacting with other species. Each species is the center of a web of at least several, and sometimes dozens, of other species on which it depends. As a result, much of evolution is driven directly by the coevolution of interacting species. This exuberance of interconnected life is what Darwin called the entangled bank. Interactions among species are continually evolving in different ways in different ecosystems, creating a geographic mosaic of coevolution that fuels the diversification of life. This talk will discuss what we have learned in recent years about coevolution as one of the major processes driving the adaptation and diversification of species. It will also discuss how human alteration of environments is affecting the coevolutionary process.

Sponsors of the 7th Smithsonian Botanical Symposium

- Cuatrecasas Family Foundation
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- The National Tropical Botanical Garden
- United States Botanic Garden

Symposium

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insect mouthparts.

Labandeira explained that there were four main spatiotemporal phases in the evolution of herbivory during the past 420 million years. The first phase (Late Silurian to Late Devonian) shows three distinct feeding groups: piercing, sucking, and boring damage. Phase 2 (Late Mississippian to end-Permian) is represented by six feeding groups, including the addition of galling, seed predation, and non-feeding oviposition. Leaf mining is the seventh feeding group added during Phase 3 (Middle Triassic to Recent). The most recent and intensively studied phase of arthropod herbivory on vascular plants is Phase 4 (mid Early Cretaceous to Recent), represented by a greater diversity of functional feeding groups.

Olle Pellmyr, Associate Professor at the University of Idaho, finished the morning session with the lecture “Coevolution and Obligate Mutualism: What We are Learning from Yuccas and Yucca Moths.” Pellmyr covered (1) the biology of the interaction, (2) phylogeny and codiversification, and (3) the role of coevolution in yucca-yucca moth interactions. He then presented a case study of a two-morph population of Joshua trees (*Yucca brevifolia*) pollinated by two different moth species (*Tegeticula* spp.). His data show that (1) moth ovipositors and ovary shape are closely correlated, which can lead to strict sense coevolution; (2) there was no abiotic niche divergence; and (3) there were different phylogenetic histories between the plants and the two moth species (e.g., moth morphology differences appeared when they first became associated with Joshua trees). Finally, Pellmyr noted how global climate change may cause a range shift of moth species (future populations will move north and to higher elevations), which may directly affect pollination of the Joshua tree populations.

After lunch, the talks, moderated by afternoon session chair Conrad Labandeira, began with John Kress, Research Scientist and Curator in the Department of Botany, Smithsonian Institution, who spoke about “From Generalization to Specialization...and Back Again in the Coevolutionary Mosaic of a *Heliconia*-Hummingbird Pollination System in the Eastern Caribbean.” Kress’ talk examined

the close ecological relationship between the shape and size of flowers and bird bills, and the co-radiation of *Heliconia* and hummingbirds. The study focused on hummingbird pollination of *Heliconia bihai* and *H. caribaea* on the islands of St. Lucia and Dominica, where male and female birds of the same hummingbird species, the Purple-throated Carib, pollinate different species at different rates depending upon a variety of factors (e.g., island, elevation, and season).

According to Kress, the data support John Thompson’s Geographic Mosaic Theory of Coevolution. In the northern range, *H. caribaea* is the dominate species; in the southern range, *H. bihai* dominates; and in the middle, both co-dominate with variation. Further, in *H. bihai*, specialist pollinators are found in the north, while generalist pollinators are found in the south.

Next, Scott Hodges, Professor at the University of California at Santa Barbara, presented the talk “Understanding Speciation and Adaptation to Pollinators: From Field to Genomic Studies of *Aquilegia*.” Nectar spur length varies greatly among the 23 taxa of *Aquilegia* in North America, making this genus a model system for examining the natural selection of floral traits. The length of nectar spurs, Hodges argues, has developed in response to pollinators. Fertile hybrids of *Aquilegia* can also be made in any North American cross, which allows Hodges the ability to conduct genetic studies.

Hodges presented a case study examining how *Aquilegia* species are reproductively isolated. Flower orientation, spur length, and flower color each have different effects on visitation rates and pollen removal by pollinating bumblebees, hummingbirds, and hawkmoths. Field studies show that the pollinators are distinguishing among flowers for the most part: bumblebees visit flowers with shorter spurs; hawkmoths with longer spurs; and hummingbirds in the middle. Paternity analysis shows that the distance between plants and differences in floral morphology reduces the probability of mating. Thus reproductive isolation is due to strong assortative mating by flower morphology.

The final invited talk of the afternoon was presented by Ted Schultz, Research

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Entomologist in the Department of Entomology, Smithsonian Institution, who spoke about "The Evolution of Agriculture in Ants: 50 Million Years of Symbiosis between Ants, Fungi, and Bacteria." With over 230 species of fungus-growing ants in the New World tropics, leaf-cutting ants are the dominant herbivores. Schultz described a complex system in which the mutualism goes beyond just two species: attine ants, fungal cultivars, filamentous bacteria that the ants culture, a fungal crop disease, and an antibiotic produced by a bacterial symbiont. The mutualism is so tight that higher attine cultivars are incapable of a free-living existence. This system presents a clear adaptation for "many-to-one" coevolution.

Invited guest speaker John N. Thompson, Professor at the University of California at Santa Cruz, concluded the symposium with a summary and perspective: "Coevolving Networks of Species." Thompson began his summary with a quote from Charles Darwin, who wrote the first statement on coevolution in a description of bee pollination. Thompson continued with the observation that if honey bees were "taken out of the equation," local extinction of plants would ensue. According to Thompson, "dismantling the web of life is such a dangerous thing to do."

Thompson described coevolution not as a species property but as a population-level process. Using a coevolutionary case study (saxifrage plants and their pollinating seed parasite *Greya politella*), Thompson showed that within a short distance (Washington, Idaho, and Oregon), one can find mutualistic, antagonistic, and commensalistic interactions. Selection is pushing different populations to different places. He ended with the big question, "Why should we care?" Coevolution, according to Thompson, is the process of how species stay in the evolutionary game. Understanding coevolution, for example, can help reduce money spent on herbivore resistance in agriculture, or determine the best control for the outbreak of an invasive species.

After the formal lectures, the participants were given the chance to interact and further discuss the process of coevolution during a reception and dinner. The highlight of the evening events was



Guest speaker John Thompson presents a summary and perspective to the Symposium participants. (Photo by Elaine Haug)

a private tour of the museum's newest exhibit: "Partners in Evolution: Butterflies + Plants." The exhibit gave the 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 biodiversity we see today. The reception was followed by a dinner in the museum's rotunda.

Next year, the Smithsonian Botanical Symposium will consider the study of genomics, with a focus on maize. The date of the Symposium is tentatively set for 27-28 March 2009. All are invited to attend.

Supplementary Symposium Links on the Web

The Web site to the 7th Annual Smithsonian Botanical Symposium <<http://botany.si.edu/events/sbsarchives/sbs2008/>> has many links and documents related to the conference. Included on the Web site is the full program, abstracts of the talks, links related to the speaker's presentations, and selected images from the various events. A digital video recording of the presentations will be posted soon. Addi-

tional items related to the Symposium can be added to the list of links and documents by sending an e-mail to sbs@si.edu.

The Symposium archive pages <<http://botany.si.edu/events/sbsarchives/>> also includes programs, abstracts and images from the past six symposia: "Linnaean Taxonomy in the 21st Century" (2001); "The Convention on Biological Diversity" (2002); "Botanical Frontiers in Southeast Asia" (2003); "Botanical Progress, Horticultural Innovations, and Cultural Changes" (2004); "The Future of Floras: New Frameworks, New Technologies, New Uses" (2005); and, "Island Archipelagos: Cauldrons of Evolution" (2006).



Additional Scenes from the 7th Annual Smithsonian Botanical Symposium



Clockwise (from top left): Participants of the symposium enjoy dinner in the Rotunda of the Museum; Cristián Samper, Acting Secretary of the Smithsonian Institution, congratulates Mireya Correa on receiving the José Cuatrecasas Medal for Excellence in Tropical Botany; a butterfly lands on a visitor's finger in the Butterfly Pavilion; the evening reception fills the Partners in Evolution Hall; botanizing in the Butterfly Pavilion. (All photos by Elaine Haig, except top right taken by Thomas Matson).



Art by Alice Tangerini

***Sampera coriacea* (Hieron.) V.A. Funk & H. Rob.**

Cristián Samper, Director of the National Museum of Natural History and former Acting Secretary of the Smithsonian Institution, was recently honored by having a genus and a species named after him (see article on page 8). *Sampera coriacea*, a widespread species from Colombia to Peru, was chosen as the type because it is the most widespread species in the genus. It is interesting to note that a different species from Peru now has the name *Sampera cuatrecasasii* (M.O. Dillon & Sagast.) V.A. Funk & H. Rob.

José Cuatrecasas, a well known botanist, studied the plants of the northern Andes, Colombia in particular, and was associated with the Department of Botany at the Smithsonian Institution for many years.



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