Department of Botany and the U.S. National Herbarium

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Department Profile

Gesneriads Turn on "The Guiding Light"

By Robert DeFilipps

High up in the humid forests of Central America, the leaves of *Columnea florida* turn on a "guiding light" for the plant's hermit hummingbird pollinators. When the sun shines, a vibrant glow is emitted through twin eyespots of translucent red tissue near the tip of each leaf. As bright as light through a stained glass window, it attracts the hovering *Phaethornis* birds to the pale yellow, nectar-bearing corollas concealed behind the leaves.

These passive leaf-lenses, which are also endowed with a deep purple halo of coloration above the eyespot, are just one of the remarkable syndromes that have evolved for the perpetuation of the Gesneriaceae. This family is the research focus of Laurence E. Skog, curator in the Department. The particular epiphytic *Columnea* mentioned above, *C. florida* from Costa Rica and Panama, was, in fact, named by Conrad V. Morton (1905-1972), the distinguished predecessor of Skog, whose interests are centered in the taxonomy, systematics and floristics of neotropical genera.

A family of approximately 140 genera and 2900 species, the gesneriads are firmly rooted in the collective mind of the general public because of two famous plants. The African violet, *Saintpaulia ionantha*, is native to coastal Tanzania, and was named by Hermann Wendland in honor of A.E.R.L. von Saint Paul-Illaire, colonial governor of Usambara Province in Tanganyika, German East Africa. Saint Paul discovered the plant and collected seeds in 1892, after which news of its existence appeared almost simultaneously in German, French and British garden journals in 1893-1895. Since the 1920s, the African violet has been horticulturally improved into thousands of cultivars (cultivated varieties). The other universally recognized plant is the florist's gloxinia, which originated as a peloric (abnormally symmetrical) mutant of *Sinningia speciosa*, from parental stock from near Rio de Janeiro. Due to the often red, orange or yellow flowers of New World gesneriads, a goodly number of them have become favorites for hanging baskets, their bright tubular flowers inspiring common names such as lipstick plant (*Aeschynanthus radicans*), candy corn plant (*Nematanthus wettsteinii*), red bugle vine (*Aeschynanthus pulcher*), and flame violet (*Episcia cupreata*).

Fiery carmine pigments allow the massed flowers of an Ecuadorian *Gasteranthus* species to be visible in dense vegetation at a distance of 50 meters, a brilliant feat of image-consolidation to beckon their hummingbird visitors, who operate without a sense of smell. It is therefore a welcome concept that Ecuador and Colombia are not only the center of distribution of the subfamily Gesnerioideae, but also constitute the center of distribution for the neotropical hummingbird family Trochilideae.

Intimate associations are known between the hummingbirds and tiny, blind flower mites that reside in gesneriad flowers, and are transported between flowers in the birds' nostrils (nasal cavities). The hummingbirds sip the nectar during pollination, and their heavy respiration creates in the nose a churning flower-odor pump, which in turn stimulates the well-ventilated mites to leave the nostrils, rapidly travel down the long beak, consume nectar and pollen, and then quickly run back up the beak (at a speed per mite-body weight equivalent to that of a cheetah), in order to enter the safety of the nostril for another hitch-hike to the next flower. For example, the mite *Tropicoseius colwelli* of the gesneriad host *Columnea microcalyx* uses the bird carrier *Colibri thalassinus*; the mite *Rhinoseius* (a genus confined to gesneriads) *tiptoni* of the host plant *Columnea purpurata* uses the bird *Aglaiocercus coelestis*, while the same mite species uses *Columnea florida* (the plant with "guiding light" leaves). To these mites, "high fidelity" is more than a musical term. The bizarre mite-hummingbird phenomenon also occurs in other tube-flowered dicots (e.g., acanths, scrophs, ericads, rubiads, mints), and monocots such as *Heliconia* (R. Colwell, *Nat. Hist.* 94(7): 56-63. 1985).

Some gesneriads such as *Codonanthe* exhibit pollination by ants. The plants grow from aerial ant-nests and possess extrafloral nectaries on the undersides of the leaves for the ants to nibble on. Curiously, seeds of the plant have an elaiosome (oil body) and they resemble ant-eggs; the ants carry them back to their nest where they germinate. The finely tuned act of pollination is facilitated in various other gesneriads by euglossine bees. A purple perfume spot in the pouch of *Gloxinia*

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Travel

John Boggan (7/5 – 7/9) traveled to Tampa, Florida to give a lecture to the American Gloxinia and Gesneriad Society (AGGS) and attend the AGGS Board of Directors meeting.

Leslie Brothers (7/5 – 7/9) traveled to Tampa, Florida to gather information and discuss growing techniques at the 44th Annual Meeting of the American Gloxinia and Gesneriad Society.

Maria Faust (7/15-7/19) traveled to San Diego, California to present a paper entitled "Biodiversity of Planktonic Dinoflagellates Species in Mangrove Ponds, Pelican Cays, Belize" at the 54th Annual Meeting of the Phycological Society of America.

Michael Bordelon (7/26 – 7/30) traveled to New Orleans, Louisiana to attend the conference of the Heliconia Society International.

John Kress (7/26 – 7/30) traveled to New Orleans, Louisiana to attend the Heliconia Society Conference, and (9/6 – 9/7) to St. Louis, Missouri to present a seminar and discuss a "Center for Conservation" at the Missouri Botanical Garden.

Alice Tangerini (7/29 – 8/9) traveled to Lisbon and Elvora, Portugal to attend workshops on botanical illustration at the Guild of Natural Science Illustrators (GNSI) meetings.

Linda Prince (8/4 – 8/21) traveled to Portland, Oregon to attend the Botany 2000 Conference, and in Portland (8/6-8/10) also attended the Botanical Society of America meetings to present her research (with John Kress) entitled "Phylogenetic Relationships Among Genera of the Prayer Plant Family (Marantaceae) Based Upon Chloroplast DNA Sequence Data." She also presented a poster entitled: "Additional Evidence of Monophyly, Paraphyly, and Polyphyly in Genera of Theaceae."

Paul Peterson (8/5 – 8/9) traveled to Portland, Oregon to attend the Botany 2000 Conference and present a paper, and (9/15 – 11/1) to San Diego, California and Chihuahua and Durango, Mexico to collect grasses.

Walter Adey (8/6 - 8/20) traveled to Quebec, Canada to analyze algal flora and community structure of the core of the North Atlantic Subarctic, to verify quantitative biogeographic models.

Pedro Acevedo (8/12 – 9/24) traveled to Puerto Rico and the Virgin Islands to collect in St. Thomas, St. Croix, Tortola, Virgin Gorda and Culebra Island.

Barrett Brooks (8/24 – 8/31) traveled to Fort Pierce, Florida to continue ongoing research.

Warren Wagner (9/3 – 9/11) traveled to Pruhonice, Czech Republic to attend a Species Plantarum Committee meeting, and (10/14) to the Missouri Botanical Garden Systematics Symposium.

Dan Nicolson (9/14 – 10/2) traveled to Berlin, Germany to collaborate with Dr. K.G. Popp and Prof. H.W. Lack on the "Cook Expedition" and "Engler's Araceae."

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Visitors

Ricarda Riina, Caracas, Venezuela; Plants of Venezuela (6/5-12/15).

Miguel Nino, Caracas, Venezuela; Monocots of "Flora de Guaramacal", Venezuela (8/2-9/20).

Rebecca Yahr, Barcelona, Spain; Lichens (8/28-9/8).

Liao Jing-ping, South China Institute of Botany, Guangzhou (IBSC); Palynology of Zingiberales (10/10-4/1).

Barbara & David Brose, Schiele Museum, Gaston Co., North Carolina; Wilkes Expedition specimens (10/26-10/27).

John R.I. Wood, Royal Botanic Gardens, Kew (K); Bolivian Acanthaceae (10/28 – 10/18).

Marcus V. Alves, Universidade de Sao Paulo (SPF); *Hypolytrum*, *Mapania* (Cyperaceae) (10/30-11/3).

Andre Amorim, Universidade de Sao Paulo (SPF); *Heteropterys* (Malpighiaceae) (10/30-11/3).

Ana Maria Suarez Alfonso, Universidad de La Habana, Cuba; Cuban macroalgae (11/1-11/21).

Taxonomic Research in the Century of the Environment

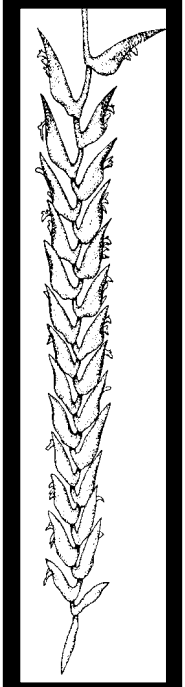
Chair With A View — W. John Kress

Answers to the fundamental research questions at the heart of modern plant systematics have direct applications to understanding and even solving some of the most critical environmental crises of today's world. What are the Earth's species? How are they related to each other and how are they distributed geographically? How have species evolved? And how can we best translate the tree of life into a useful and predictive classification of taxa? Never before have the results of natural history science been more applicable to the needs of society than in the first decades of the new century. Since the 1800s the great natural history museums and botanical gardens of the world have sent explorers around the globe on scientific missions to discover and document the wonders of the biological world. Sometimes these scientific voyages of discovery also had direct economic benefits, as exemplified in the spice wars and the horticultural obsession of the Victorian Age when plant products of great monetary value, such as orchids, were brought back to Europe from Asia and South America. Today the results of our taxonomic research are more in demand for practical applications to society and economies than ever before. For example, not a week goes by without some reference in national newspapers and magazines to the economics and politics of biodiversity prospecting.

Systematics can be broadly defined as the study of the origin, evolution, diversity, and distribution of life on the planet. It includes not only investigations of the evolutionary processes that have led to the origin of this diversity, but also the explicit description of biotic diversity itself. If we have no understanding of the biological entities that make up our present day ecosystems (be they species, genera, families or higher order clades), we cannot hope to understand how they interact with each other nor how they interact and respond to the environment. In today's world of radical habitat change and environmental degradation, unless we know what are the species that inhabit particular ecosystems we have no hope to successfully manage them in a thoughtful and effective manner.

It has been pointed out that museums are a unique, and perhaps threatened, research environment themselves. With their extensive and outstanding holdings of biological collections, clearly they are the best venue for investigating and describing the diversity of life. Curiously universities have begun to divest their biological collections and programs in systematics just when the value of these activities is once again on the rise. The responsibility, therefore, falls on the world's museums and botanical gardens to vigorously pursue taxonomic activities in order to provide the data necessary for managing the earth's environments. The current explosive rise of bioinformatics will finally allow biological data on the distribution and diversity of organisms resulting from the study of museum collections to be used in effective ways for monitoring environmental change and identifying centers of biotic diversity. As a result governments as well as NGOs, who are dependent on these data, will be able to make responsible decisions with a new confidence on the conservation of species and habitats.

Plant systematists are ready and willing to make available the results of their scientific studies for the purpose of understanding and conserving the environment. Although they may not choose to engage in the management activities themselves, they are committed and dedicated to preserving the entities they study. Systematists at natural history museums and botanical gardens should be recognized and appreciated for their efforts to address today's societal challenges as well as their contributions to the basic scientific knowledge about living things. More than ever our research has become fundamental to the conservation of life on the planet.



Staff Activities

Alice Tangerini attended the first international meeting of the Guild of Natural Science Illustrators, GNSI Portugal 2000, from 30 July - 8 August held in the cities of Evora and Lisbon, Portugal. The host of the meeting, Pedro Salgado, a well known ichthyology illustrator and instructor, recruited his students to organize the ten day event which included five exhibitions of art and photography, numerous slide lectures and workshops, and field and sketching trips. Tangerini was a presenter in two lectures, "History of the Guild", along with Elaine Hodges (former NMNH Entomology illustrator) and "Preservation of Scientific Illustrations in a Natural History Museum Environment" with staff NMNH illustrators, Mary Parrish and Molly Ryan. In addition, she took part in a Techniques workshop demonstrating botanical illustration using brush and pen with ink. This meeting attracted GNSI members from several European countries and even a member from New Zealand.

The core meeting was held the first week in Evora, a walled city, at the University of Evora. The University, dating from the fifteenth century, had stone walls over a foot thick and maintained a cool tempera-

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Staff Research

Robert Faden worked at the Royal Botanic Gardens, Kew for two weeks in August, then spent two weeks in Meise, Belgium attending the 16th Congress of l'Association pour l'Etude Taxonomique de la Flore d'Afrique Tropicale (AETFAT) and doing herbarium work at the National Botanic Garden of Belgium (BR). At Kew he continued studies of Commelinaceae for *Flora of Tropical East Africa* and *Flora Zambesiaca*. An interesting discovery was that two related, sympatric species of *Commelina* in Kenya and Tanzania could be distinguished by the type of hairs on the adaxial surface of the leaf midrib, in addition to other characters. Pubescence is notoriously variable within genera in this family, so it was very surprising to find that vegetative pubescence could distinguish closely related species of *Commelina*.

At the AETFAT Congress, Faden gave a talk entitled: "Towards a Monograph of African *Commelina* (Commelinaceae): a Multifaceted Approach." In the BR herbarium he concentrated on doing a preliminary sorting of the enormous number of Commelinaceae collections from the former Belgian Congo (now the Democratic Republic of the Congo) and other parts of Africa that are housed in this institution. He also visited the greenhouses and updated the naming of the cultivated Commelinaceae.

John Kress conducted fieldwork in June on St. Lucia and St. Vincent in the Lesser Antilles in collaboration with Ethan Temeles of Amherst College and Elvia Melendez-Ackerman of the University of Puerto Rico. Temeles has discovered an interesting sexual dimorphism in the Purple-throated Carib hummingbird, which is the main pollinator of *Heliconia caribaea* and *H. bihai*, indigenous to this region. The male hummingbirds with short bills primarily defend territories around plants of the former species of *Heliconia* while females with long curved bills trapline between individuals of the latter species. Kress is studying the variation in morphology of the heliconias and plans to use genetic markers to determine the phylogenetic relationships among the species as well as population structure of the plants within and among the islands. Collaboration with both Temeles and Melendez will provide further insights into the origin of this co-evolutionary system.

Dan Nicolson spent over two weeks (14 Sept. – 2 Oct.) in Berlin, Germany working mostly on the botany of the 2nd Cook Expedition (1772-1775) but also on Engler's *Araceae Exsiccatae et Illustratae*. Most of the time was spent with Klaus-Georg Popp, a humanities scholar at the Berlin-Brandenburg Academy of Science, now working on the final (6th) volume of the 20-volume "*Georg Forsters Werke*" published over the last 40 years.

The 6th volume will be concerned with George Forster's work in natural history, and Popp has spent the last three years transcribing George Forster's natural history publications as well as, most importantly for Nicolson, the extensive G. Forster manuscripts [a gift of George's wife to the Representatives of the People of France in 1794] now in the Central Library of the Museum of Natural History in Paris.

As reported by Nicolson: "Although Popp already had generously supplied me with his transcriptions of the botanical manuscripts, I felt it was important that I also study the original [prints made from microfilms] manuscripts. He was delighted to have someone who knew the plants and could comment on the significance of the various botanical manuscripts."

Nicolson now had a first-hand understanding of the amount of botany, if not mineralogy, anthropology, and zoology, that was done during the voyage and access to the Academy's already published extensive correspondence. Surprisingly, botanists have been fed a false line rooted in a controversy with the Admiralty, William Wales, resonated by J. E. Smith, and magnified by E. D. Merrill, that the Forsters (father and son) knew and did nothing but copy everything from the Banks & Solander manuscripts of the 1st Cook Expedition, and not even do that very well. The immediate result is that instead of having a comment at the end of "Remarks" about Forster manuscripts, Nicolson will now have a whole paragraph on "Paris Forster Manuscripts" after "Range" and before "Forster published texts".

The other project involves 301 lithographed drawings and/or specimens of Araceae distributed by Engler from 1882-1886. Presumably complete sets of the undistributed labels and drawings, at least some of the specimens, and possibly some pickled material have recently been located at the Berlin Botanical Museum Herbarium. These are of interest to Nicolson because some may actually be the first valid publication of new aroids published later elsewhere by Engler. They are of interest to Berlin because they have just had a special exhibit on Engler, which led to the rediscovery of the material. A paper will be published in *Willdenowia* as soon as the concerned individuals get the actual dates of receipt/distribution of the sets.

Rob Soreng, research associate, collected over 400 grass specimens in the Pacific Northwest this summer (4 June - 26 August), ranging from 40º 56' N to 71º 21' N, Humboldt Co., California to Pt. Barrow, Alaska. In Alaska he annotated 1.5 herbarium cases worth of *Poa* for ALA, and collected from the Kenai Peninsula north to Prudhoe Bay and Pt. Barrow. Twenty-seven species and 8 infraspecific taxa of *Poa* were collected along with some 250 leaf samples of those on silica gel for DNA extraction. Alaskan mosquitoes were generally very numerous and very hungry, but fortunately they are large, slow, and their bites do not itch for long.

Dieter Wasshausen visited Bolivia on 25 July - 11 August, to make collections and observations in the Parque Nacional Noel Kempff Mercado near the Brazilian frontier. The highlight of the trip was collecting on the Meseta de Caparus, which is the area that Colonel Fawcett discovered in 1910 and his novelist friend Sir Arthur Conan Doyle launched to fame with his book "*The Lost World*". Vegetation here was truly unique for Bolivia, similar to that encountered on earlier collecting trips to the Planalto of Brazil, mostly cerrado and some gallery forest species.

Staff Recognition

Trixis pruskii Hind (Compositae: Mutisieae), a new species of tree from Bahia, Brazil, was published recently in *Kew Bulletin* 55: 381-386. 2000. The plant was dedicated by Nicholas Hind of the Royal Botanic Gardens, Kew to "**John Pruski** of the Botany Department, Smithsonian Institution, Washington DC, a fellow synantherologist and collaborator." Pruski has named four new species of Mutisieae and also revised a related group of Mutisieae occurring north of the Amazon River in a paper entitled "The Mutisieae of the Lost World of Brazil, Colombia, and Guyana" (*Bol. Museu Paraense Emílio Goeldi, Sér. Botânica* 7: 335-392. 1991).

Obolaria: A Study in Imponderables

By D.H. Nicolson

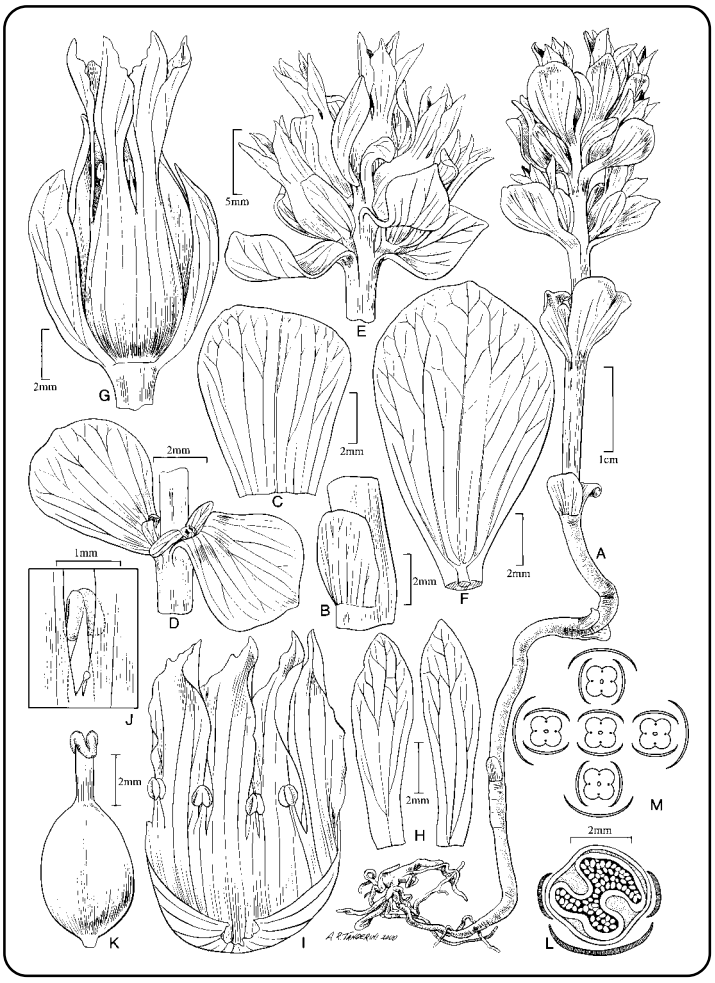
Obolaria (*O. virginica* L.) is a unispecific genus native to eastern North America and a spring-flowering member of a group of reportedly saprophytic genera of the Gentianaceae. It is called pennywort, a name resonating with its generic name suggesting a similarity of the leaves to a penny, an oblolos being a low denomination coin of the ancient Greeks. According to Holm (*Ann. Bot. London*, 11:369-383. 1897) the generic name *Obolaria* was first given by Siegesbeck (1686-1755) to a plant that Linnaeus decided to name for himself, *Linnaea borealis*. Being of thrifty stock, Linnaeus recycled Siegesbeck's name for our plant.

Recently, one-time research trainee, now botany graduate student Jason Grant asked for assistance in collecting fresh material for a DNA study of relationships in and around the Gentianaceae. **Stan Shetler** and **Dan Nicolson** remembered seeing *Obolaria* while on a field trip with Kitty Parker along Turkey Run in the 1960s. Nicolson, with **Gary Krupnick**, went out on 20 April 2000 and walked up Turkey Run without success. On the way back, while looking at old beechdrops, Krupnick spotted it a foot away. Once spotted they saw at least 10 more plants. The following Monday a group from the Department returned, and in addition to this original population, found another one nearby. **Leslie Brothers** and **Jaques Cayouette** took numerous pictures and **Alice Tangerini** collected fresh material for vouchers and illustration.

The request for material resulted not only in fresh material but two interesting botanical questions posed by Nicolson. The first *Obolaria* imponderable: what is the difference between a leaf, a bract, and a calyx? Fernald's *8th edition of Gray's Manual of Botany* (1950) gives us a reasonably persuasive analysis: "leaves…opposite", "calyx of 2 spatulate…sepals resembling the leaves." However, Radford et al.'s *Manual of the vascular flora of Carolinas* (1964-68) says "…upper [leaves] foliaceous…each flower subtended by 2 foliaceous bracts…(usually referred to as calyx). Calyx absent." Holm presents convincing evidence that the final two foliaceous structures are in the position of sepals, not bracts, with the other 2 lobes lost in evolution.

The second imponderable: given that *Obolaria*'s aerial parts (other than the whitish corolla) have chlorophyll, is it hemiparasitic on beech or hemisaprophytic on leaf litter in beech woods? In his species description Fernald only says, "the lower leaves scale-like." Radford et al. only say "Lower leaves bractlike." Holm indicates that the plant provides its own starch and "is neither parasitic nor saprophytic." However, when discussing its root system Holm noted anomalies: no root-hairs but elongated epidermal cells that "reminds us of Saprophytes" and "the bark-cells will be found to be filled with glomerules of fungal hyphae, showing that the root has become a mycorhiza."

For inexplicable reasons Holm says that it "grows in soil poor in humus, and in localities which are neither shaded nor very moist." Because of this he seems to conclude that the plant is an autophyte. However, our plants grow in moist, well-shaded and deep humus. They look like hemi-saprophytes with some chlorophyll enabling them to do some photosynthesis and mycorrhizae that allow them to take up nutrients from decomposing humus.



The Conservation Column

By Gary A. Krupnick

Current research in conservation biology within the Department is coming from an unlikely source as of lately. **Paula DePriest** and her graduate student **Rebecca Yahr** (Duke University) have been conducting research on *Cladonia perforata*, a federally listed endangered lichen species. Of the 962 species listed as endangered in the U.S., only two are lichens. Compared to the 565 flowering plant species, it comes as no surprise that lichens typically do not make headlines. Recently, *Science News* devoted its cover issue to lichen biodiversity (Vol. 158; August 2000).

Cladonia perforata was described in 1952 by lichenologist Alexander Evans from a species collected on Santa Rosa Island off of Florida's panhandle. Since its description, it has been found in 13 other locations, all in central Florida. In 1995, Hurricane Opal flattened and denuded the dunes on Santa Rosa Island, reducing the *C. perforata* community by seventy percent. Current research by DePriest and Yahr focuses on reintroduction of the lichen to its original habitat. Replanting efforts are proving to be astonishingly difficult. Molecular research shows that lineages from the central Florida populations differ sharply with the panhandle population, reducing hope of working with transplants. The survivors of the hurricane, however, are beginning to show recolonization efforts on areas of exposed sand. The research by DePriest and Yahr has been funded through grants by the National Science Foundation's Partnerships for Enhancing Expertise in Taxonomy (PEET), the US Fish and Wildlife Services and the US Air Force.

Tangerini

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ture even during the heat of the day. The most difficult part of the meeting was the mile long walk between the University and the hotels on hilly cobblestone streets. Members soon learned to bring large bottles of water along as the heat was extremely dry and the Portuguese food was for the most part, salty. Portuguese cuisine was known for its salt cod (bacaulao) and shellfish, often served with pork. Tangerini's illustrations of *Stromanthes* and *Orchidantha* were on display at the GNSI annual members exhibit in the Palace of Dom Manuel known historically as the site where Magellan received his orders from the King. One of the field trips was to a castle in Monseraz near the border of Spain. Members feasted on wine, bread and the famous Evora sheep's milk cheese.

During the second week the meeting moved to Lisbon where most of the GNSI sponsored exhibits could be viewed at local art and natural history museums. A field trip to the Parque Natural da Serra da Arrabida featured a botanical walk down steep cliffs to see a variety of the mostly Mediterranean flora of many resinous shrubs. Also visited was an area where dinosaur footprints were visible in the rock face. The meeting banquet was held in the Castle of Sao Jorge at one of the highest points in Lisbon. The last day she managed to find the Jardim Botanico in Lisbon where the herbaceous plants seemed to have suffered from the spring drought. The only plant in flower that seemed to have survived well was *Justicia brandegeana* L.B. Smith & Washausen.

Skog

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perennis attracts male *Eulaena meriana* bees which collect aromatic compounds thought to play a role in their courtship, a perfect case of andro-euglossophily. Numerous other instances are known of adaptations for gesneriad pollination by hawkmoths (sphingophily) and other moths (phalenophily), bats (in *Capanea* plants) and flies. To top it off, each category of pollinator has its own corresponding preferable flower-shape.

The aforementioned center of gesneriad speciation and distribution, Ecuador and its immediate environs, is the subject of collaborative work by Skog and Lars Peter Kvist of the Royal Veterinary and Agricultural University, Copenhagen, Denmark. They have jointly published revisions of Ecuador *Columnea* (*Allertonia*, 1993), as well as of neotropical genera exemplified by *Gasteranthus* (*Syst. Bot. Monog*. 2000), *Pearcea* and *Reldia*. The type genus of the family, *Gesneria*, was revised by Skog in 1976.

Laurence Skog was born in Duluth, Minnesota, and received a B.A. from the University of Minnesota in Duluth (1965); M.S. degree from the University of Connecticut, Storrs (1968); and Ph.D. as a student of Harold E. Moore at Cornell University, Ithaca, New York (1972). A former chairman of the Department (1988-1992), Skog first arrived at the Smithsonian in 1972 as assistant editor with the Flora North America Program, which resulted in a revised provisional checklist of species for Flora North America, co-edited with Stanwyn G. Shetler (1978) and published by the Missouri Botanical Garden.

Associate curator from 1973-1986 and full curator in the United States National Herbarium since 1992, Skog is in charge of the largest herbarium collection of New World Gesneriaceae in the world, estimated at 20,000 sheets. Critical field collections of the plants have been made during his research trips to New Zealand, Australia, Lord Howe Island, Mexico, Puerto Rico, Jamaica, Haiti, Dominican Republic, Guyana, Suriname, French Guiana, Honduras, Panama, Venezuela, Chile, Peru, Colombia, Ecuador, Brazil, India and China. In a significant departure from his largely neotropical work, a massive treatment of Chinese gesneriads, covering 442 species, was recently prepared by three Chinese

botanists, Laurence Skog and Smithsonian research associate Anna L. Weitzman, and published in *Flora of China* 18: 244-401 (1998). As director of the Floristics Office in the Department, Skog supervises the teamwork of museum specialists Robert DeFilipps and Shirley Maina, who are variously databasing, editing and writing treatments for the *Flora of the Guianas* (44 families), *Flora of China* (Commelinaceae, Caryophyllaceae *partim*), and the departmental *Revised Checklist of the Plants of Myanmar (Burma).*

Hundreds of potted specimens of gesneriads are growing in the departmental greenhouse at the Museum Support Center, Silver Hill, Maryland. There, one finds a remarkable assortment of plants with different floral and vegetative modifications (subterranean organs sometimes mark important differences between genera). These include specimens awaiting exact identification, such as an undescribed species of Brazilian *Nematanthus* ('Santa Teresa'); a probably unnamed, red-haired Ecuadorian *Pearcea*; and an undescribed Mexican species, collected by Dennis Breedlove, having greenish-white, fimbriate corolla lobes. On the benches there is even a specimen of *Primulina tabacum*, a Chinese endemic with leaves having the smell of tobacco, recently rediscovered in the wild by a Chinese illustrator who worked with Skog. An easy to grow plant with unusual bullate leaves, which Deborah Bell collected in the Cerro de la Neblina, Venezuela, named *Nautilocalyx pemphidius* L.E. Skog (1989), has now been introduced into the horticultural trade. He is the namesake of *Camellia skogiana* C. X. Ye (1996), and of the endemic Chinese gesneriad *Chirita skogiana* Z.Y. Li (1998).

The greenhouse collections also form an important living resource for Skog's assistant John K. Boggan. In addition to maintaining living research plants in the environmental chamber by regulating daylength, light, temperature and humidity, and managing several gesneriad databases of 42,000 specimens as well as photographing plants, Boggan is a frequent contributor of journal articles and enjoys creating hybrids in *Kohleria* and East Asian *Chirita*; he is past president of the National Capital Area chapter of the American Gloxinia and Gesneriad Society. Boggan collaborated with Skog in the production of the 3,000-title *Bibliography of the Gesneriaceae*, which Sylvia Stone-Orli has coordinated for the Department website.

The world of Gesneriaceae continues to offer many challenges to Skog, and he is always finding new ones. Currently they include cladistic analyses of *Gasteranthus* in collaboration with Elizabeth Zimmer and other workers; studies of Ecuador endemics (with John Clark) and Ecuador extinctions (with Lars Peter Kvist); molecular marker studies of correlations in gesneriad corolla shapes, with Eric Roalson and Zimmer; a gesneriad checklist for Colombia with Kvist; a treatment of the family for *Flora of the Guianas* with Christian Feuillet; and, a Checklist of Old World Gesneriaceae, as well as a Neotropical Gesneriaceae Synonymy List, with Boggan. New genera and species have been discovered and are coming out of these works. And new databases will incorporate information for treatments in Flora Mesoamericana and Flora Neotropica. The Skog/Gesneriad connection seems to be benefiting everyone, just as hummingbirds and euglossine bees benefit the gesneriads.

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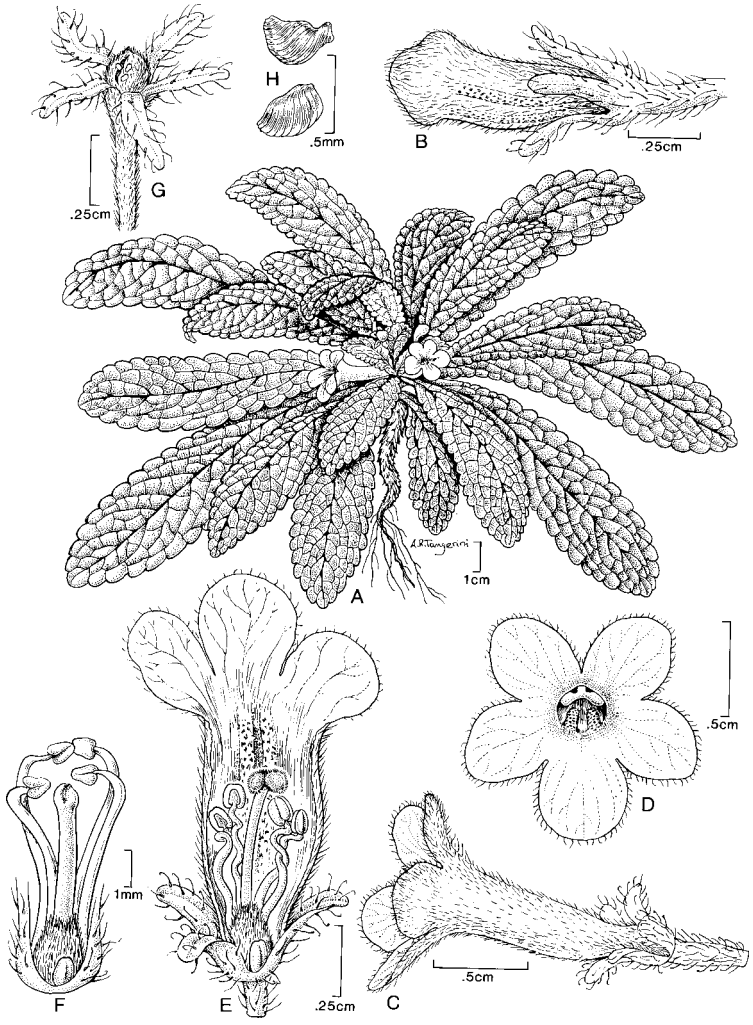
Art by Alice Tangerini

Nautilocalyx pemphidius L.E. Skog

Nautilocalyx pemphidius L.E. Skog, *Systematic Botany* 14(3):281 (1989), is a white-flowered gesneriad confined to the Cerro de la Neblina region of southern Venezuela. The type specimen was collected by Deborah Bell. Leaves have an unusual bullate surface, resembling a mat of bubbles.



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