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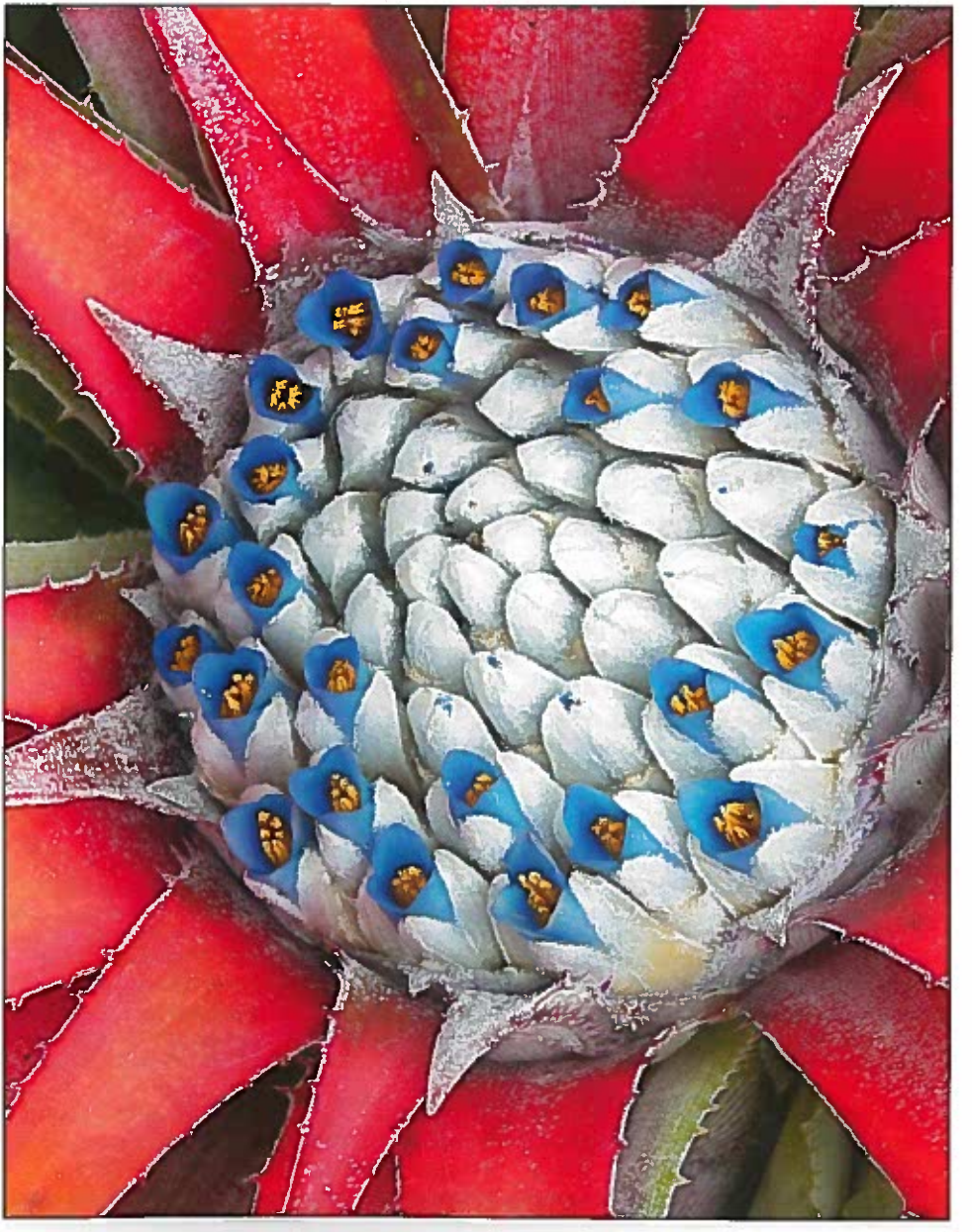

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Cover photographs. Front: The spectacular *Fascicularia bicolor*. Photograph by Dutch Vandervort. Back: Some pictures from a bromeliad adventure in Costa Rica. See article by Bruce McCoy on page 111 in this issue. Photographs by Bruce McCoy.

FEATURE ARTICLES

BROMELIAD SOCIETY EVENTS, BUSINESS, AND NEWS

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Pitcairnia cantuoides (Bromeliaceae): A New Species from the Inter-Andean Valleys of Chuquisaca, Bolivia

Roberto Vásquez Ch.[1] & Pierre L. Ibisch[2]
Photographs and Drawing by Roberto Vásquez Ch.

Abstract: The number of Bolivian *Pitcairnia* species has doubled since the publication of the monograph by Smith & Downs. As an outcome of a recent field trip to the valleys of the Chuquisaca department, now, we present a new species with Cantua-like flowers: *Pitcairnia cantuoides* sp. nov. It is similar to the sympatric *P. multiramosa* but differs by its linear, monomorphic leaves that are 20 to 30 mm wide and serrulate and not constricted at the base, a simple inflorescence, much longer floral bracts, much shorter pedicels, and lepidote petals with a ligulate appendix. One of the historical localities of *P. multiramosa* is geographically re-defined. Additionally, it is suspected that *P. multiramosa* could turn out to be a synonym of *P. paniculata*.

Resumen: El número de especies de *Pitcairnia* en Bolivia se ha duplicado desde la publicación de la monografía de Smith & Downs. Como resultado de un viaje reciente por los valles del departamento de Chuquisaca, Bolivia, presentamos ahora una nueva especie con flores parecidas a *Cantua: Pitcairnia cantuoides* sp. nov. Es parecida a la simpátrica *P. multiramosa* pero difiere por sus hojas lineares, monomorfas, de 20-30 mm de ancho y aserruladas y no estrechadas en la base, una inflorescencia simple, brácteas florales más largas, pedicelos más cortos, y pétalos lepidotos con un apéndice ligulado. Se re-ubica una de las vagas localidades históricas de *P. multiramosa*. Además, se sospecha que *P. multiramosa* podría ser un sinónimo de *P. paniculata*.

Introduction

As the floristic inventory of Bolivia for a long time was very deficient, the richness of the flora of this tropical country was underestimated. The increase of knowledge of the species of *Pitcairnia* illustrates how recently we have started to have a better idea of the Bolivian biodiversity. Smith & Downs, in 1974, listed only 10 species. Until 1999, when we published the first modern checklist of Bolivian bromeliads, we knew 15 species (Krömer et al. 1999; excluding *Pitcairnia caricifolia* that was listed as a species of *Pepinia*); some taxa known from neighboring countries had been recorded in Bolivia, and one beautiful endemic species had been described as new (*P. amboroensis*, Ibisch et al. 1999). In recent years, four new species have been discovered: *P. heydlauffii* (Vásquez & Ibisch 2000), *P. kroemeri* (Luther 2000), *P. mohammadii* (Ibisch & Vásquez 2003) and *P. chiquitana* (R. Vásquez & P.L. Ibisch 2005). As an outcome of a recent field trip to the valleys of the Chuquisaca department, now, we present another new species.

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Figure 1. Inflorescence of *Pitcairnia cantuoides*.

Thus, the number of Bolivian *Pitcairnia* species has doubled since the publication of the monograph by Smith & Downs (1974). A majority of the species is found in the humid montane Yungas forests, especially in the northern part of that ecoregion. A diversity and endemism center in the Bolivian lowlands that has become known only recently is the region of the Brazilian shield (*P. caricifolia*, *P. platystemon*, *P. mohammadii*, *P. chiquitana*). In the southern Andean valleys, mainly belonging to the semihumid Tucuman-Bolivian forest ecoregion, apart from the new species to be presented, several taxa have been recorded: *P. cardenasii*, *P. divaricata*, *P. multiramosa*, *P. paniculata*.

Pitcairnia cantuoides sp. nov. R. Vásquez & P.L. Ibisch. TYPE: Bolivia: Chuquisaca. Prov. Tomina, between Padilla and Monteagudo, Río Mojo Torillo, 1300 m, 19°32'S, 64°09'W, Oct. 6 2004, *R. Vásquez, W. Krahn & R. Müsch 4956* (Holotype: LPB; Isotype: Herb. VASQ). FIGURES 1-3.

P. cantuoides similis est *P. multiramosa* Mez sed foliis unimorphis linearibus basin versus serrulatis angostioribusque, inflorescentia simplice, bracteis floralis longioribus, pedicellis brevioribus et petalis lepidotis differt.

Plants terrestrial, pseudobulbus, flowering over 50 cm high. ***Pseudobulbs*** 4.5 cm in diameter. ***Leaves*** all alike, persistent, in a fasciculate rosette; ***sheaths*** broadly ovate, 2 cm high, 4 cm wide, white at base, castaneous toward the apex, glabrous adaxially, densely castaneous-lepidote abaxially, margins entire; ***blades*** not differentiated, linear, long-attenuate, over 50 cm long, 2-3 cm wide, not constricted at base, light green, densely gray-lepidote abaxially, glabrous adaxially, margins serrulate toward the base, elsewhere entire; spines antrorse, 1-2 mm long, dark brown. ***Scape*** erect, ca. 35 cm long, 7 mm in diameter, sparsely white-flocculose, light green; ***scape bracts*** erect, adpressed, narrowly triangular, long-attenuate, glabrous, 4-9 cm long, longer than the internodes, laxely serrulate towards the base. ***Inflorescence*** simple, racemose, erect, incompletely known, ca. 15 cm long, light green, sparsely white flocculose; ***floral bracts***, 15-20 mm long, ca. 4 mm wide, longer than the pedicels, triangular, entire, apex rostrate, drying-brown at anthesis, glabrous. ***Flowers*** spirally arranged, 10-15 in number, to 6 cm long, suberect; ***pedicels*** light green, 4-6 mm long, sparsely white flocculose; ***sepals*** narrowly triangular, straight, light green, 22-23 mm long, ca. 6 mm wide, externally sparsely white flocculose; ***petals*** oblong linear, white at base, red towards the apex, recurved at anthesis, exposing the anthers, 49-50 mm long, externally sparsely white-floculose, 7-8 mm wide, apex round, short apiculate, the base with a single basal serrate appendage, partially connate to the base of the petals; ***androecium*** 50 mm long; ***stamens*** equaling the petals, white; ***anther*** linear, 8 mm long, yellow; ***gynoecium*** 56 mm long; ***ovary*** short conical, whitish, 4 mm long; ***ovules*** bicaudate; ***stigma*** 4 mm long, orange, spirally arranged. ***Fruit and seeds*** not seen.

Figure 2. Flowers of *Pitcairnia cantuoides*.

Etymology: The epithet of this new species is derived from *Cantua*, genus of the Polemoniaceae family, because of its similar flowers. The *Cantua bicolor* or 'cantuta', how it is vernacularly known, is the national flower of Bolivia.

Somewhere in the same valleys where the new species has been recorded, the type locality of *Pitcairnia multiramosa* is located. It shares red flowers with *P. cantuoides*, but there are several significant differences. Among others, *P. cantuoides* has linear, monomorphic leaves that are 20 to 30 mm wide, serrulate, and not constricted at the base (vs. narrowly lanceolate, dimorphic, 35 mm. wide, serrulate toward the apex and narrowed above

the sheath), a simple inflorescence (vs. bipinnate), much longer floral bracts (20 mm long vs. 5 mm), much shorter pedicels (6 mm long vs. 18 mm), and lepidote petals with a ligulate appendage (vs. glabrous and unappendaged).

Eleven of the 20 Bolivian *Pitcairnia* species have attractive flowers that are orange-red to dark-red in color, a feature related to the adaptation to hummingbird pollination: *P. amboroensis, P. brittoniana, P. cantuoides, P. cardenasii, P. divaricata, P. heydlauffii, P. inermis* var. *inermis, P. multiramosa, P. odontopoda, P. paniculata,* and *P. riparia*.

Pitcairnia cantuoides appears to be endemic to the inter-Andean valleys of the Chuquisaca department. Specifically, it has been found in gorges close to the Río Mojo Torillo that drains into the Río Azero, forming part of the Plata river system. The habitat is typical of the mid-elevations of the semihumid Tucuman-Bolivian forest ecoregion. It is sympatric with at least the following bromeliads: *Fosterella penduliflora, Fosterella sp., Aechmea bromelifolia, Vriesea maxoniana, Tillandsia* aff. *argentina,* and *Tillandsia edithae*. Additionally, the following cacti species have been recorded: *Lepismium lorentzianum, Cleistocactus azerensis,* and *Cleistocactus bulbis-cauda*.

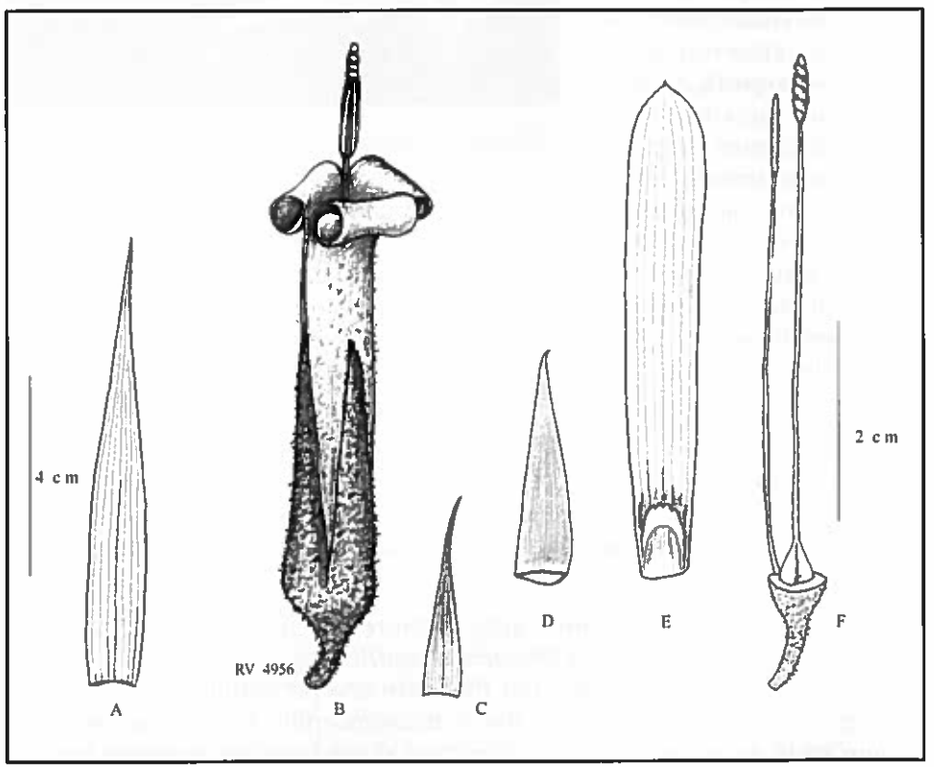

Figure 3. *Pitcairnia cantuoides*. A. Scape bract. B. Flower. C. Floral bract. D. Sepal. E. Petal. F. Androecium and gynoecium.

Searching for *Pitcairnia multiramosa*.

The valleys where *Pitcairnia cantuoides* was discovered are also the type locality of *P. multiramosa*. Indeed, this species was collected during the same field trip. Here we present the first photograph of this species to be published (FIGURE 4).

The type locality of *Pitcairnia multiramosa* cited by Smith & Downs (1974) is rather vague. It is indicated to have been collected by Weddell in the region of Azero, Chuquisaca. It is known that the medical doctor and botanical explorer Hugues d' Algernon Weddell (1819-1877) was collecting in the department of Chuquisaca accompanying the expedition of Count Francis de Castelnau in the mid 19th century (Cárdenas 1952). The second known collection of the species was made by the Bolivian botanist Martín Cárdenas in 1958. This collection is cited by Smith & Downs (1974) as well, but as the first one, it is lacking an exact geographical description of the locality. However, Cárdenas, in his biographic book 'Memorias de un naturalista' mentions the circumstances of the collection of *P. multiramosa*: "Cerca de la quebrada de Heredia, donde se siente un fuerte olor sulfuroso proveniente de unas vertientes termales, coleccioné la hermosa bromeliácea de grandes flores rojas *Pitcairnia multiramosa*'." (Cárdenas 1973) [Translation by the authors: "Close to the gorge of Heredia where one feels a strong sulphurous odor from the thermal springs, I collected the wonderful bromeliad with large red flowers *Pitcairnia multiramosa*".]

In October 2004, the first author visited the Chuquisaca department with the hopes of re-collecting *Pitcairnia multiramosa*. The Heredia gorge mentioned by Cárdenas was not found on maps, but with the help of some local peasants it was possible to locate it. Arriving at the gorge, the same sulphurous odour was perceived that had been described by Cárdenas. Other pitcairnias have also been recorded from the humid slopes of the gorge and surroundings. As the plants were not flowering it was impossible to find out if they really were *P. multiramosa*. Thus, several living specimens were collected and flowered six months later. Comparing the characteristics of the plant with the description provided by Smith & Downs it was possible to conclude that indeed *P. multiramosa* had been re-discovered. The exact locality is the following: **Bolivia**, Chuquisaca: Provincia Hernando Siles: km 102 de Padilla a Monteagudo, Quebrada de Heredia, 1250 m, 19°47'27"S, 64°02'30"W, 6 Oct. 2004, *R. Vásquez, W. Krahn & R Müsch 4969* (LPB, VASQ).

While distinct from *Pitcairnia cantuoides*, *P. multiramosa* is rather close to the variable and widely distributed *P. paniculata*. A careful comparison of both taxa is warranted. The main differences which separate *P. multiramosa* from *P. paniculata* are unappendaged petals (vs. petals appendaged) and serrate leaves (vs. slightly serrulate leaves) [Smith & Downs (1974)]. However, when one considers the enormous ecological adaptability and morphological variability known of *P. paniculata* in Bolivia alone, it is likely that there will be new synonyms of this species, and *P. multiramosa* could be one of them.

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Vásquez, R. & P.L. Ibisch 2005. *Pitcairnia platystemon* Mez and *Pitcairnia chiquitana* sp. nov. (Bromeliaceae), two related species from the Chiquitano mountains, Santa Cruz, Bolivia. Vidalia 2(2): 3-10.

Figure 4. Inflorescence of *Pitcairnia multiramosa*.

Book Reviews

Jason Grant[3]

Jewels of the Jungle -Bromeliaceae of Ecuador, Part II Pitcairnioideae. José M. Manzanares. 2005. Imprenta Mariscal, Pp. 241-544. 30 cm, hard cover, ISBN: 9978-44-022-4, ISBN: 9978-44-021-6, English or Spanish.

This is second of a three-part planned treatment of the Bromeliaceae of Ecuador. Triumphant after the first, Manzanares continues his high benchmark of quality. As before, the excellence in preparation, layout, and design makes this the most esthetically pleasing as well as scientifically accurate treatment of Bromeliaceae for any country. The first chapters thoroughly cover the background of the subfamily with photos of most genera, many not even occurring in Ecuador.

The book essentially treats the two genera of Pitcairnioideae native to Ecuador, *Puya* and *Pitcairnia*. *Puya* comprises 36 taxa, 10 of which are described as new: *Puya brackeana, P. cajasensis, P. cuevae, P. dodsonii, P. hirtzii, P. longispina, P. navarroana, P. pattersoniae, P. tillii,* and *P. x loxensis*. *Pitcairnia* comprises 84 species, 14 of which are described as new: *Pit. bakiorum, Pit. bifurcatispina, Pit. brackeana, Pit. cataractae, Pit. cofanorum, Pit. condorensis, Pit. deroosei, Pit. goudae, Pit. lutheri, Pit. marinii, Pit. neillii, Pit. palaciosii, Pit. susannae,* and *Pit. tillii*. There are complete descriptions of genera and species, etymology, observations, list of herbarium specimens examined, and distribution. The book is also replete with photos of each species, in detail, habit and/or in habitat.

As before, I congratulate José and his collaborators on preparing such a fabulous book. This second volume as is the first, is a definite requirement for all horticulturists, hobbyists, scientists, and librarians to have on their bookshelves. I shall very much look forward to the third volume (already in preparation) covering the Tillandsioideae!

Manual de plantas de Costa Rica, Volumen II. Gimnospermas y Monocotiledóneas (Agavaceae-Musaceae). B.E. Hammel, M.H. Grayum, C. Herrera, y N. Zamora, Editores. Monographs in Systematic Botany from the Missouri Botanical Garden, Volume 92. Missouri Botanical Garden Press. 2003. 25 cm, hard cover. ISBN 1-930723-22-9, Spanish.

This second volume of the manual to the plants of Costa Rica covers gymnosperms and half of the monocots (Agavaceae-Musaceae); the remaining monocots including grasses and orchids are covered in volume three. The Bromeliaceae (pp 297-375) authored by Francisco Morales covers 17 genera and 194 species: *Aechmea* (17), *Ananas* (2), *Androlepis* (1), *Araeococcus* (1), *Billbergia* (1), *Bromelia* (3), *Catopsis* (10), *Greigia* (1), *Guzmania* (28), *Mezobromelia* (1), *Pitcairnia* (18), *Puya* (2), *Racinaea* (5), *Ronnbergia* (1),

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Tillandsia (39), *Vriesea* (6), and *Werauhia* (58). As the species numbers indicate, the most important genus is *Werauhia* that has its center of distribution and greatest species diversity in Costa Rica.

This is an excellent flora that comprises all the required parts: family description, descriptions of genera and species, keys to genera and species, habitat and locality information, key characters, a single line-drawing per genus, and a single representative specimen citation per species. There are a few color photos as well, but the purpose of the manual is as a scientific piece of work, not a coffee-table book. For all of us who have worked in Costa Rica over the years, this flora is very much welcomed and appreciated. It is very much recommended as a fine example of a well-prepared flora.

An introductory field guide to the flowering plants of the Golfo Dulce rain forests. Costa Rica; Corcovado National Park and Piedras Blancas National Park (Regenwald der Oesterreicher). Anton Weber, Managing Editor. Catalogue of Oberoesterreichisches Landesmuseum, new series nr 172. Stapfia 78m. 2001. 27 cm, soft cover. ISSN 0252-192X, ISBN 3-85474-072-7, English.

As the title clearly suggests this is a field guide to the plants of southern Costa Rica, particularly of the Osa Peninsula and surrounding areas of the Golfo Dulce. The Bromeliaceae is described in 9 pages of text that includes family description, separate keys to the genera and species in the flora, and very brief descriptions of species with the most important field characters. Ten genera described: *Aechmea* (6 sp.), *Araeococcus* (1 sp.), *Bromelia* (1 sp.), *Catopsis* (4 sp.), *Chevaliera* (1 sp.), *Guzmania* (4 sp.), *Pitcairnia* (5 sp.), *Tillandsia* (12 sp.), *Vriesea* (2 sp.), and *Werauhia* (5 sp.). Color photos of select species are printed at the end of the volume in a series of plates. The size probably prohibits the use as an actual field guide, but it is certainly an excellent volume to learn the flora of this botanically species rich area of Costa Rica.

Flora da Reserva Ducke, guia de identidicaçâo das plantas Vasculares de uma floresta de terra-firme na Amazônia Central. Ribeiro, José Eduardo L. da S., et al. Eds. INPA-DFID (Instituto Nacional de Pesquisas da Amazônia). 1999. 800 pages, 24 cm, soft cover, Portuguese.

This landmark work on a tract of Amazonian forest is the most extensive published volume on any neotropical rainforest. It is also useful as a general guide to all plant families and genera that occur in the Amazonian basin well beyond the Ducke reserve. For each family there is a family description, descriptions of genera and species, keys, color photos of flowers, fruits, leaves, and bark in situ, as well as a single leaf of each species photographed once dried as an herbarium specimen. The volume seems to focus on trees, but many herbaceous families are also described. Four pages of text and photos are devoted to the Bromeliaceae, describing *Aechmea bromeliifolia, A. contracta, A. mertensii, A. setigera, Araeococcus micranthus, Bromelia tubulosa, Guzmania brasiliensis, G. lingulata, Neoregelia eleutheropetala, Pepinia sprucei, Streptocalyx poeppigii, S. rodriguesiana, Tillandsia bulbosa,* and *Vriesea splitgerberi*.

Catalogue of the vascular plants of Guaramacal National Park, Portuguesa and Trujillo States, Venezuela. Laurence Dorr, Basil Stergios, Alan R. Smith, and Nidia L. Cuello A. Department of Botany, National Museum of Natural History, Washington, D.C. 2000. Contributions from the United States National Herbarium Volume 40: 1-155. 24 cm, soft cover. ISSN: 0097-1618, English.

Guaramacal National Park is found in the Andes of Venezuela at the northeastern most extent of the Cordillera de Merida. As this is a catalogue, no descriptions are provided. However specimen citations are provided for all species. 19 taxa of Bromeliaceae have been identified in the flora region: *Aechmea paniculigera, Greigia albo-rosea, Guzmania mitis, G. squarrosa, Mezobromelia capituligera, Pitcairnia brevicalycina, P. hitchcockiana, P. maidifolia, Puya aristeguietae, P. venezuelana, Racinaea spiculosa, R. tetrantha* var. *caribaea, R. tetrantha* var. *miniata, R. tetrantha* var. *scarlatina, R. tetrantha* var. *tetrantha, R. tetrantha* var. *A, Tillandsia compacta* var. *intermedia, T. complanata,* and *Tillandsia myriantha*.

La culture des Orchidées et des Broméliacées, Le gouvernement des serres tempérées et chaudes. [The cultivation of orchids and bromeliads, how to manage temperate and hot greenhouses]. Jean Parisot, Albert Roguenant & Claudie Roguenant. Belin, Paris, www.editions-belin.com. 2002. 127 pages, 24 cm, soft cover. ISBN 2-7011-3055-7, French.

This is a handy French-language book on how to grow orchids and bromeliads (e.g., temperature, light, aeration, watering, fertilizing, soils, supports). It also perhaps more thoroughly discusses the insects and diseases these plants may get, and how to treat them. Translations of chapter titles include: "Cultivation", "Ravagers, predators, and parasites", "Non-viral diseases", "Viruses", "Treatments", and "Causes of some types of damage". It is thoroughly illustrated with color photographs and line-drawings, and is heartily recommended for all growers.

Un amour d'orchidé, le marriage de la fleur et de l'insecte. [An orchids' love, the marriage of flower and insect]. Albert Roguenant, Aline Raynal-Roques & Yves Sell. Belin, Paris, www.editions-belin.com. 2005. 480 pages, 28 cm, soft cover. ISBN 2-7011-4012-9, French.

Yes, a book in French about orchids and insects! This book written by the authors of "Les Tillandsia et les Racinaea" (see J. Bromeliad Soc. 52(1): 38. 2002, and review above) continues their vigorous efforts to describe interactions between flowers and insects, whether bromeliad or orchid. It is the talented and combined efforts of an entomologist (Roguenant), and botanist (Raynal-Roques) that make the work so praiseworthy. This volume on the interactions between insects and orchids is nearly self-explanatory even if you can't read French. Nearly every page has a high-quality color photograph, detailed line drawing, or some sort of figure illustrating orchids and/or insects and their interactions. It is the type of book that can certainly be adapted for study of bromeliads, and it is hoped that such a book on bromeliads alone would one day appear.

The book especially details the many diverse and clever ways orchids attract insects to visit the flowers to effectuate pollination. Translations of chapter titles include: "Orchids, magnificent fireworks, the diversity of their allurements", "When orchids attract man", "When orchids seduce insects", "Beauty and the beast, the partners", "Assisted autogamy, the example of vanilla", "Mixed marriages or hybridization", and "What's the future for orchids?". It is a must for every orchid grower, and has many lessons for us interested in bromeliads.

In Memoriam: Anna C. Watkins & F. Marian Snowden

H. Alton Lee[4]

The Florida West Coast Bromeliad Society (FWC) recently lost two early mainstay members. Mrs. Anna C (Jinx) Watkins, 87, died April 11, 2005 and Mrs. F. Marian Snowden, 94, died on May 17.

Both women were tireless supporters and contributors in multiple ways to the FWC over its long history. Mrs. Watkins [pictured in JBS 52(1): 14. 2002], a horticultural instructor, was not a charter member of the FWC, but joined when the club was in its infancy. No single other person in the club's entire history did more to recruit and educate new members than Jinx, who became something of the poster woman for the group, appearing endlessly at any plant event to promote bromeliads and the local society. She is credited with holding the society afloat during some of the troubled times most groups face, if they have a long history.

Jinx was an early proponent of local societies having libraries and pushed the club to purchase all available bromeliad literature. She was also a strong supporter of a club newsletter originated by the late Henry J. Rahmlow for both the FWC and The Tampa Guild. Plant societies around the country have followed this early innovative lead.

Mrs. Watkins was also chairman of the club's first bromeliad show and sale held in 1964 at a Clearwater Bank. The event proved historic and legendary attracting bromeliad people from all over the world and in effect beginning what are now known as the BSI biannual gatherings.

According to no less an authority than Mulford Foster, this was the first ever show and sale anywhere in the world devoted exclusively to bromeliads.

Mrs. Snowden (FIGURE 5), a descendent of two pioneer Pinellas County families, came to Florida West Coast in the 60s. She had taken early retirement as a high school cafeteria manager in the Pinellas County School system in order to realize a life long dream: to own a plant nursery, which she admirably succeeded in doing. It was a backyard enterprise at her home in Tarpon Springs, which just kept growing. Marian admitted she was a lifelong "plantaholic", who loved virtually any family of plants. Her nursery was jammed with aroids, gesneriads, ferns, begonias and her two special favorites, orchids and bromeliads.

Figure 5. Marian Snowden (right) with H. Alton Lee.

She frequently hosted FWC events and over the years donated generously both material and money to help the society. New members constantly patronized her nursery because of the range and reasonable costs of the bromeliads and other plants she zealously stocked. Selby Gardens was also remembered among others when Mrs. Snowden dispersed her bromeliad art and book collection"

The loss to the FWC of these two gifted members is a hard blow. Jinx and Marian were the kinds of members that plant societies always desperately need and search for, but so seldom find.

News From Selby Botanical Gardens

Bruce K. Holst, BSI Editor

The Marie Selby Botanical Gardens, a leading center of bromeliad and orchid study and display, has appointed Roger Birkel as new President and CEO. Mr. Birkel, brings thirty-five years of non-profit leadership and environmental advocacy to the Gardens, including over thirty years in senior positions at the Baltimore Zoo and St. Louis Zoological Park. A passionate media spokesperson for environmental conservation and scientific discovery, Mr. Birkel is known for implementing distinctive and inspirational visitor experiences.

The Gardens also announces that a new herbarium is under construction and should be completed by November, 2005. The herbarium houses over 90,000 dried and pressed botanical specimens, including nearly 10,000 bromeliad specimens and 150 bromeliad type specimens. The 1000 square foot herbarium will provide secure storage for these valuable specimens in conditions that will allow for easy access and the proper conditions for their long-term care.

[4] Gulfport, Florida, USA

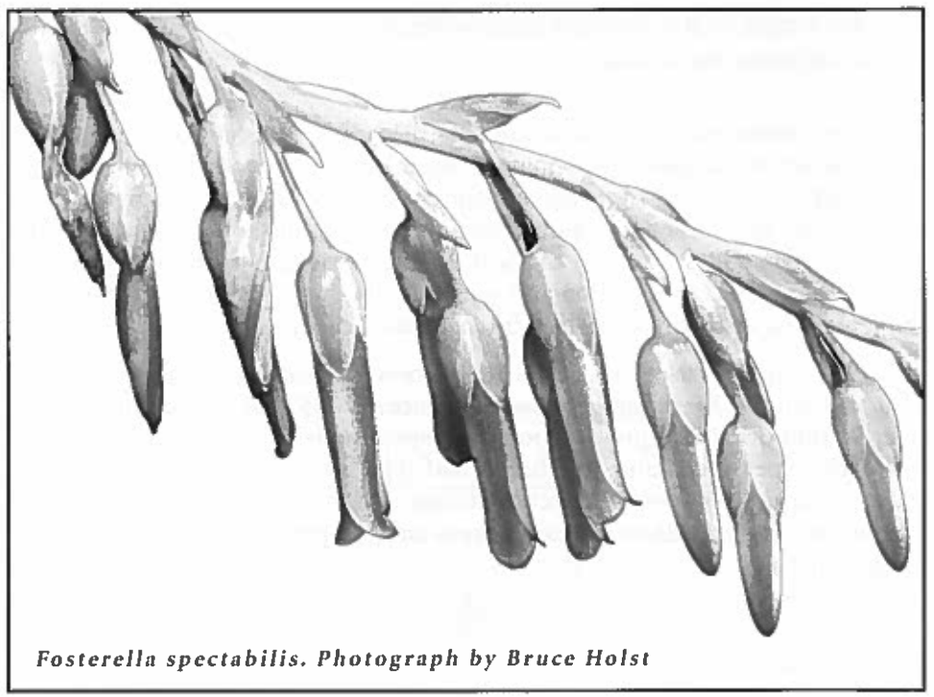
Events Calendar

UNITED STATES

November 18-20, 2005. *INDEPENDENT PLANT BREEDER'S CONFERENCE.* A conference to inform independent plant breeders how to successfully bring their hybrids to market. University of Florida, Institute of Food and Agricultural Sciences. Ft. Lauderdale Marriott North, Ft. Lauderdale, FL, USA. For more information, contact www.conference.ifas.ufl.edu/ipbc.

June 7, 2006. WORLD CONFERENCE JUDGE'S SCHOOL 3. The all-day school will be held in San Diego. Pre-registration, including a small fee is required. For more information, contact Betty Ann Prevatt, JCC Chairman, at 239-334-0242 or email bprevattpcc@aol.com.

June 6-11, 2006. *WORLD BROMELIAD CONFERENCE*, Large show and sale, judged competion, lectures, social events, and more. Sponsored by the Bromeliad Society International and the San Diego Bromeliad Society. Town and Country Resort Hotel, Mission Valley, San Diego, California, USA. Hotel rates are $124 per night. For more information, contact BSI Membership Secretary, 1608 Cardenas Dr. NE, Albuquerque, NM 87110, USA. E-mail: membership@bsi.org; or visit www.bsi.org.



Fosterella spectabilis. Photograph by Bruce Holst

Costa Rica: A Bromeliad Adventure

Bruce McCoy[5]

When I saw a fare of only $400 round trip from San Francisco, California to Costa Rica this past January, I knew I had to go. I'd been on bromeliad hunting trips to Panama, Nicaragua, Guatemala and Belize, but had somehow never gotten to Costa Rica.

Sending emails around to folks I knew and inviting them to join me on the trip was fun - I figured I'd likely have a traveling companion, but wasn't sure who among my bromeliad-loving friends would be able to take the time to come along. As it turned out, Carl Carter and I booked tickets and found ourselves on a flight from San Francisco to San José, Costa Rica, on a lovely Sunday morning in January. We arrived in San José in the evening after a day of flying and quickly found the driver who was to take us from the airport to our hotel (Kap's Place) in the area of San José called Barrio Otoya.

The hotel was comfortable enough and they had arranged for the rental car service to bring our 4 x 4 to us at the hotel on our first day. We planned to spend very little time in San José and spent only time enough to get breakfast and locate an office of the government which sold detailed topographical maps which we hoped would supplement the tourist maps and road atlases we had brought with us. On our first day we drove south and west out of the capital toward Aserri and then toward the hills of Cerro Caraigres (7230 feet; 2200 m). (FIGURE 6).

At first we didn't see too many bromeliads at these relatively lower elevations, but eventually along a river we found some nice specimens of *Tillandsia fasciculata* and a few other tillandsias. Deciding that this direction didn't seem to hold much promise for further exploration, we took the road back toward Monterrey and Frailes and then out on Hwy. 222 toward the Interamericana. Along this road in the stretch above La Lucha we began to see a profusion of bromeliad species in the genera *Tillandsia, Catopsis,* and *Werauhia*. It was along this road that

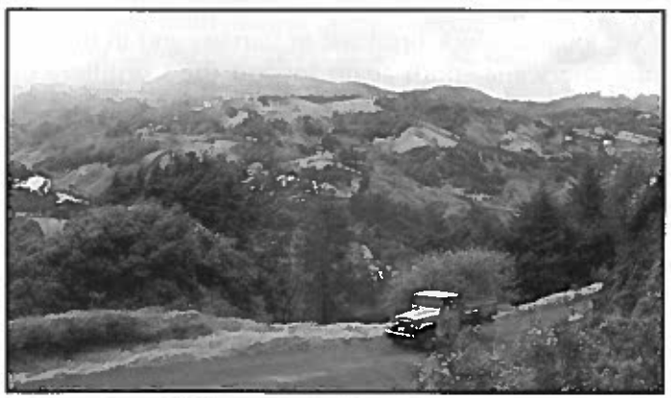


Figure 6. The landscape south of San José, Costa Rica, is mostly fragmented forest.

[5] San Francisco, California.

we found some spectacular specimens of *T. multicaulis* and *aWerauhia* (perhaps *W. nephrolepis*) that bore the most wonderful rusty red and yellowish green colors with intense banding (FIGURE 7).

Along the stretch of highway 222 above La Lucha we made several stops and spent quite a bit of time exploring the areas around the road that were accessible by foot. The road cuts here were veritable gardens of bromeliads with numerous species in abundance. After scouring the area for some time and hiking up above the road on some paths we found to the hillside above, we noticed some small but quite red spikes of something poking up from what appeared to be a large grassy mound on a cliff edge above us. Using binoculars, it became clear that this was likely a bromeliad of some kind. Having aroused our curiosity for a closer look, Carl expertly used a large 10' stick to knock a chunk of the clump to the ground where we could examine it. Upon a closer look, we decided it was likely *Werauhia insignis*. The clump we found was about one-half meter across and had dozens of distinct plants within it; many of which were in bloom (FIGURE 8).

Not knowing how far we were from our next hotel (and not having decided where that was to be) we realised as it was getting dark that we ought to find a place for the night and drove up to the Interamericana and then back toward the central valley and stayed for the night at a hotel in the city of Cartago. This town is not a real hotbed of excitement, though it is well known for the ruins of the Basilica de Nuestra Señora de Los Angeles and for having been founded as Costa Rica's capital city in 1563. We attempted to stay at the Los Angeles Lodge, but it was filled and so we were diverted to a place in an area of town that is a bit less than savory with a reputation for hotels generally rented by the hour rather than by the evening. As luck would have it, the Hotel San Francisco was not of this type and was a relatively new hotel of just six spacious rooms located on a second floor above a video store that had just opened by an American expatriate and his Costa Rican wife.

The following day we found a quick breakfast in Cartágo and in the rain headed back to the Interamericana south again toward the Cordillera de Talamanca and Cerro de la Muerte. We decided to make several stops again along the Interamericana where we'd stopped the afternoon before to head down a few other side roads and found numerous species of *Tillandsia, Catopsis, Guzmania* and *Werauhia* (FIGURE 45 on back cover). Along the road cuts we explored, we discovered that the werauhias often grew epiphytically on the trees above as well as on the rocky cuts along and above the road. Among the bromeliads often grew a profusion of epidendrum orchids with orange and red blooms.

We had read that the birders were attracted to the lodges and forests along the cool and soaring slopes of Cerro de la Muerte (Mountain of Death; 11,450 feet, 3490 m). It is here in the misty higher elevations where the famed quetzals are seen. From the Interamericana we took the somewhat unimproved road down to San Gerardo de Dota and stayed at the Albergue de Montaña Savegre. We'd read about the hotel in our Lonely Planet guide and

were attracted to the notion of this lodge as an excellent place for birds and felt that it would be interesting from a bromeliad perspective as well.

According to Lonely Planet, the hotel was founded by Don Efrain Chacon in 1957 and is still in the same family. The farm is now part orchard and part dairy ranch. One can hike above the orchards that line the hills above the hotel (6800 feet; 2070 m) to reach several hiking trails into the primary forest. On our second day in San Gerardo de Dota we hiked for a full day on the trail that winds way above the valley and eventually traces a ridge at 9200 feet (2800 m), then descends to 7500 feet (2290 m) and then climbs to a second ridge at 8800 feet (2680 m) and then circles back to the trailhead above the orchards.

It was along this trail that we hiked in largely undisturbed primary forest and saw a profusion of bromeliads in the trees of all kinds. Often in trees way above our heads we saw gorgeous bright red-banded werauhias with a reddish glow that was intoxicating. Fortunate for us (not so fortunate for many of the bromeliads), the weather was quite windy and cool and the high winds had actually blown down many large limbs along the trail and in the forest along the trail so we were able to get up close and examine colonies of plants that had only very recently been high above the trail and thoroughly unreachable otherwise.

When we reached the highest ridge at 9200 feet (2800 m) the air was clear, fresh, and almost cold with a strong wind. Along the ridge were colonies of thoroughly wet sphagnum moss that grew with amazing reddish tips where exposed to the direct sun. We took an opportunity here to go off the trail and explore the somewhat elfin forest on the ridge and found some amazing specimens of *Tillandsia biflora* with orangish reddish stripes along the yellowish green leaves (FIGURE 47 on back cover). We also found some amazingly delicate and small racinaeas here with a marvelous bulbous quality to their form.

It seemed that January was a good month for several species of *Werauhia* to be in bloom and we happened upon quite a number of "wind-fall" specimens in full spike with blooms open. It seemed that many of the werauhias in bloom were of the green types and while we did not see any of the spectacular red ones with blooms open, we did see some with spikes forming (FIGURE 11).

In and among the profusion of plants on this trail we also found specimens of the wonderful *Vriesea castaneobulbosa* (FIGURE 9). This plant has grayish leaves and an amazing pink pendant spike that is often branched. While this seemed somewhat rare as we first ventured out onto the trail, we saw more and more of this plant the further we hiked up into the forest.

When we left San Gerardo de Dota and headed back up the very steep road to the Interamericana, our 4 x 4 suddenly started to get very hot and then began to boil over! This sudden and unfortunate incident caused us a bit of a delay as we waited for the vehicle to cool down so we could add water and get it going again. After we got it back up onto the Interamericana it seemed to keep its temperature within range, but we always kept a very close eye on it.

Figure 7. Gorgeous *Werauhia*, perhaps *W. nephrolepis* with rusty red and yellow-green banding, found growing in leaf mold.

Figure 8. *Werauhia insignis* growing above the road cut in the rock outcropping.

Figure 9. *Vriesea castaneobulbosa* with pendant, branched spike.

Figure 10. Spectacular view across the mountains from the Interamericana highway near its highest point, looking south.

Figure 11. Large red-banded *Werauhia* individual, possibly *Werauhia ororiensis* in bright exposure.

Figure 12. *Werauhia ororiensis* growing near where the road from San Gerardo de Dota meets the Interamericana highway.

Figure 13. *Tillandsia oerstediana*, growing in a pasture.

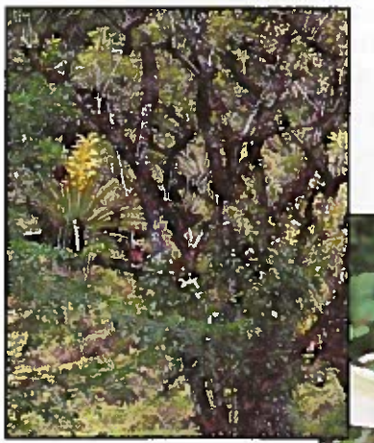


Figure 14. Purple and green leafed *Werauhia latissima* growing at the Monte Sky nature preserve.

There were some amazing large werauhias growing abundantly where the road from San Gerardo de Dota meets the Interamericana. These plants were large and greenish with very large pinkish spikes (FIGURE 12). These plants seemed to thrive in the odd elfin forests here at this very high elevation where it seemed to always be cool and shrouded in swirling mists. It was also here that we found some spectacularly bright red (werauhias?) growing exposed on the elfin trees (FIGURE 18).

It is at this very high elevation where Costa Rica's cloud forests give way to the bare and windswept páramo. This is the farthest north example of the páramo environment that is commonly found in the higher elevations of the Andes in South America. And it is here, as in the Andes, that one finds puyas in Costa Rica. The puyas grow in this páramo terrain, which is water soaked thicket of sharp grasses and very large ferns resembling cycads with trunks. At one point along the road we stopped to explore the area (10,050 feet, ca. 3060 m) and managed to scramble and pull ourselves up above the road to the steep hillside some 30 feet (9 m) above the Interamericana. Slogging through the grasses one must be careful as this area is very wet and it seems that water is running like a river down the hillside occasionally forming and filling deep holes that one can easily slip into. We found that most of the puyas here had spines, although we found one small colony of spineless, or nearly spineless plants that were quite remarkable.

After exploring the windswept páramo, and before heading back down into Costa Rica's central valley area, we decided to see what bromeliads grew in the lower elevations on the back side of Cerro del Muerte toward the Pacific Ocean. We drove to much lower elevations and saw trees filled with colonies of a very large *Tillandsia oerstediana* (FIGURE 13). We ascended to the high elevations where the white clouds of mist parted for spectacular views across the mountains to the south (FIGURE 10).

From here we decided to spend our final two nights in the Orosi valley area. The Orosi valley is quite picturesque with long-established coffee plantations rising from the valley up towards the higher elevations. Rather than spend a day at Tapantí National Forest, the German hosts at our lovely hotel in the town of Orosi suggested we spend the day hiking at a private nature reserve in the mountains above the town called Monte Sky. They provided us with directions through the coffee plantations and we drove to the parking area. The reserve itself is actually high above and we hiked up a steep and muddy path to the main lodge. From here we received a hiking map and decided we would hike up to the waterfall above the lodge.

The path to the waterfall crosses back and forth over a stream with dense growth and very wet rocks which we used as stepping stones to get across the water. At the base of the cliff the water falls in a huge roar sending up a mist that envelops the forest for quite a distance. We decided to brave the water and walked almost to the point where the water hits – we were drenched by this point and stood in the chilly water looking up above us to

where the water comes rushing over the cliff edge (FIGURE 17). Standing there is amazing as you are completely soaked and surrounded with the immense sense and noise of the water falling all around. Huge swirls of white mist rise and are swept out of the stream bed into the forest where dripping epiphytes cling to their drenched hosts.

After hiking to the waterfall we decided to hike further up the mountain above the lodge. Along the way we found some beautiful specimens of *Werauhia latissima* with purplish colour under the leaves (FIGURE 14). The path here feels nearly vertical and one climbs the path using water and mud soaked roots to pull oneself upwards into the dark forest. In this dark undergrowth we came upon some amazing bromeliads in spike with a gorgeous orange/red spike. These clumps of *Aechmea veitchii* (FIGURES 16 & 46 on back cover) thrive in the darker areas of the forest where we also found an amazing gesneriad with huge brown and furry leaves.

Knowing that our flight back to the USA was an early one, we left Orosi in the late afternoon and spent our final night in Costa Rica back in San José at Kap's Place. We flew out of San José on the early flight to Houston and as we ascended I marveled at the terrific view of the south toward the Cordillera de Talamanca and Cerro de la Muerte. The pilot then took the plane west toward the Pacific before making the turn to head north and left Costa Rica as a fond memory (FIGURE 15).

Figure 15. A view back toward Cordillera de Talamanca and Cerro de la Muerte.

Figure 16. *Aechmea veitchii* growing above the Orosi Valley at the Monte Sky private nature preserve.

Figure 17. The waterfall at the Monte Sky nature preserve

Figure 18. Small, but colorful bromeliad growing in the elfin forest above 9000 feet (2750 m).

Fascicularia bicolor

Dutch Vandervort[6]

I have been growing fascicularias about 30 years. I have tried to feed them, tried to force them, tried to baby them in every imaginable way. Someone once told me they are halophytes — they love salt, sodium chloride, sea salt! I doused several of them with saltwater — all to little avail.

Figure 19. *Fascicularia bicolor* in cultivation in southern California.

The secret is benign neglect! Ignore them, do not actively try to kill them, but leave them somewhat stressed and they bloom much more frequently (FIGURE 19). I grow my plants with a western exposure, half day sun from noon on. I had a small one bloom a year or two ago that was so beautiful, I gave it to Adrienne Burks, a local artist as a project for water color and she produced a painting almost as fine as the plant itself (FIGURE 20).

These plants are tough and resilient. I understand that they have been grown in southern England. Their natural habitat is the littoral area of Chile, central and southern coast. They may tolerate salt, but I no longer add it to the water I give mine - not even as an occasional treat. Though they are shy bloomers, when they do bloom they are magnificent!

Figure 20. A water color painting of *Fascicularia bicolor* by Adrienne Burks.

Figure 21. Water color of Dutch Vandervort's house in southern California, by Adrienne Burks.

Adrienne, the artist that drew the *Fascicularia* watercolor is the same artist that drew the picture of our home (FIGURE 21). She sent us a photocopy of the drawing that so impressed us that I bought the original from her. She had sent us a note in the mail addressed "Dear homeowner

6. Ventura, California

Darkest Delights

Geoff Lawn, BSI Director, Australia

No bromeliad is truly devoid of leaf colour (i.e., black), but some come close with predominant or solid shades of indigo, magenta, mahogany and aubergine purple, to deepest ebony. These dark beauties can be loosely grouped into two categories of those with rather fixed pigmentation and others of very variable foliage hues. Anthocyanic pigments, which mask or combine with the green undertone and serve several purposes, produce this foliar attractiveness.

Some bromeliads have inherently-high amounts of anthocyanins, such as *Cryptanthus zonatus* forma *fuscus*, many of whose progeny hybrids are dark to a degree, even in moderate to low light. Excessive light can turn them an objectionable muddy brown shade. Characterised by thin, shiny leaves, in this group the bicolored-leaf aechmeas, notably *Aechmea victoriana* var. *discolor* and *A. fulgens* var. *discolor* are parents to 'Belizia', 'Betty Pfeuffer', 'Black on Black', 'Black Jack ', 'Black Flamingo', 'Black Tiger', 'By Golly', 'Chocolate Soldier', 'Dark Crystal', 'Ebony Glow', 'Grape', 'Jean', 'Lullaby', 'Mirlo', 'Nightlight', 'Pica', 'Perez', 'Prieto' and 'Tonado'. Cultivars or hybrids of *A. orlandiana, A. nudicaulis, A. recurvata,* and dark-leaved clones of *A. chantinii* are 'Blackie', 'Black Beauty', 'Black Marble', 'Black Panther', 'Black Prince', 'Jackson' (syn. 'Bill Barrett'), 'Nigre', 'Pickaniny' and 'Shadow'. In other genera of forest-dwelling ancestry are *Nidularium* 'Nana', *Canistropsis* 'Plum' (FIGURE 22) and a host of *Cryptanthus* (FIGURE 23), such as *C. acaulis* var. *ruber*, 'Black Cherry', 'Black Magic', 'Darkling', 'Deep Purple', 'Don Garrison', 'Genuineus', 'Gillian's Joy', 'Mason Congo', 'Out of Africa', 'Sangria' and 'Witches' Brew'.

The other category has thicker or more leathery leaves and tends to require direct sunlight or bright diffused light. Reliant on the daylight length and intensity to induce this seasonal "suntan" effect, they revert to greener tissues if available light is inadequate. Of course, during the growing phase poor light, such as constant cloud cover, and overfeeding particularly with Nitrogen can result also in excessively long, narrow leaves, affecting rosette shape. In many cases species name forms with the invalid term "rubra" added (e.g., *Aechmea lueddemanniana* 'Rubra') may be genetically similar to "normal" (unless the extra redness is transmitted by seed) but rather are more light-exposed specimens, whose foliage colour soon fades in lower light.

Examples are *Alcantarea* 'Black Cinders', *vinicolor*; *Dyckia* 'Cherry Coke', 'Dark Chocolate', 'Dark Night', *encholirioides*, 'Gypsy', 'Port Wine', 'Red Devil', 'Ruby Ryde'; *Billbergia* 'Black Gem', 'Clyde Wasley', 'Sangre'; *Neoregelia* 'Black Bandit', 'Black Devil', 'Black Magic', 'Chocolate', 'Dark Delight', 'Dark Diva', 'Dark Horse', 'Darkest Hour', 'Dexter's Pride', 'Fosperior', 'Little Black', 'Little Africa', 'Mandela', 'Midnight'(Wurthmann), 'Pitch Black', 'Plum Sheen', 'Popolo', 'Prince of Darkness', 'Purple Princess', 'Royal Flush', 'Voodoo Magic', 'Thor'; *Werauhia sanguinolenta* 'Rubra'. Among bigenerics are *Cryptbergia* 'Red Burst', *Neomea* 'Magenta Star', *Nidumea* 'Midnight', *Neophytum* 'Burgundy Hill', 'Shiraz' and *Ortholarium* 'Burgundy'.

Over 4000 different plant pigment compounds called flavonoids are known, present in all higher-ranked plant families' foliage, roots, stems, flowers, bracts, fruit, berries, seeds, and even bark. Flavonoids are sub-divided into chalcones, flavones, flavanols, flavanones, isoflavanoids, and anthocyanins.

To date there are nearly 600 different anthocyanins discovered in the plant kingdom. Their main purpose in bromeliads is to shield or screen the upper leaf surfaces' DNA and photosynthesis process from excessive sunlight damage. This function applies especially to sun-exposed, sparsely-scurfed wild species in the thinner atmosphere at high altitudes, particularly if stressed through moisture and nutrient deficiencies. Comparable foliage colouring nearer sea level is not always possible in cultivation. In deep shade-tolerant species in forest habitat it seems likely that dark red or purple anthocyanins in the foliage reverses (e.g., *Canistropsis burchellii*) gather and reflect unabsorbed light back into the mesophyll, effecting photosynthesis, since solar radiation is proportionally enriched in red and far red light by selective absorption of the shorter wavelengths as it passes through leafy canopies. Anthocyanins in bromeliad foliage are sometimes more pronounced at flowering, as per *Billbergia* 'Penumbra' whose outer leaves turn more inky blue. Many types have castaneous inner leaf sheaths (e.g., *Aechmea caudata*) or blackish outer leaf bases (e.g., *Vriesea erythrodactylon*) which are thought to encourage small fauna to hide and defecate there, nourishing the plant. Dark blue "fingernail" leaf tips (e.g., *Vriesea bituminosa*) are considered as possible cue markers for pollinators. Pronounced blackish horizontal crossbands (e.g., *Vriesea splendens*), vertical cyanic pinstripes (e.g., *Guzmania lingulata*), and deep purplish foliage spots (e.g., *Neoregelia pauciflora*) may enhance autotrophic performance (carbon gain).

A select group feature blackish inflorescences in part. A number have navy blue or black petals, including *Pitcairnia nigra, Tillandsia atroviolacea,* and *Puya humilis*. Such species' flowers attract pollinators by either bright scape or leaf bracts, or in the case of *Puya coerulea* var. *violacea*, scarlet- branched rhachis (stems) with prominent gold stamens protruding from black petals. Vrieseas 'Negro' (FIGURE 25) and 'Van Ackeri' display amaranth scape bracts with contrasting yellow flowers. In many species (e.g., *Aechmea bracteata*) mature fertile ovaries or berry sacs change to blackish pods when ripe, a signal for seed eaters that they are edible, ensuring the viable blackish seeds within are distributed once excreted.

Another theory maybe applicable to bromeliads as with other plants is that certain foliage anthocyanins are bitter-tasting, repelling predators. More detailed field studies are required for definitive answers specific to bromeliads.

The solar radiation used by plants to manufacture carbohydrates is photosynthetically active radiation (PAR). Most if not all bromeliads convert this

energy by the complex C3 type photosynthesis pathway. Four primary classes of leaf pigments utilising the full light spectrum, often in tandem, are:

1. Chlorophylls. Chlorophyll A absorbs visual light spectrum wavelengths other than green (particularly red and violet) and reflects blue-green light. Similarly, Chlorophyll B, an accessory pigment, reflects yellow-green light.

2. Carotenoids. Absorb blue light and pass the energy over to Chlorophyll A molecules. They also protect against short wavelength visible and ultraviolet radiation. Reflect orange-yellow light.

3. Xanthophylls. Associated with carotenoids and assist chlorophylls. Reflect yellow light.

4. Anthocyanins. Reflect red, violet and blue light rays.

In cultivation at least, particularly responsible for foliage burn is ultraviolet (UV) light, which is outside the visible light spectrum of 400-700 nanometers (nm). Based on wavelengths, it is divided into UV-A, UV-B and UV-C. The longer wavelength UV-A has less energy and causes little or no damage to humans or plants. UV-C is absorbed by atmosphere oxygen and rarely strikes the Earth's surface.

UV-B is absorbed by ozone and as the Earth's ozone layer has depleted in the last 40 years, UV-B damage is potentially more harmful when it strikes

Figure 22. *Canistropsis* "Plum".

Figure 23. *Cryptanthus* "Snakeskin".

upper leaf surfaces, releasing energy. UV-B radiation can rupture the cell membranes and chloroplast organelles, interrupting photosynthesis. UV-B can cause the plant's paired strands of genetic material in the DNA double helix to become cross-linked, preventing cell division and other vital cellular processes such as protein production. Damaged leaf tissues can become discoloured and die. Generally, healthy plants can grow through the UV-B irradiation damage if it's not severe. In bromeliads anthocyanins act as stress markers and these water-soluble pigments accumulate in the vacuoles of the epidermal or sub-epidermal cells but possibly in the leaf mesophyll also.

A number of plain green and grey-leaved bromeliad species and cultivars simply will never redden no matter how intense the light exposure – anthocyanins are absent. Their foliage bleaches and may even sunburn, particularly if shifted suddenly from low light positions to maximum exposure. Others at best "bronze up" or turn pink but don't achieve dark red to purplish-black tones. Other factors influencing the outcome are the day length, diurnal temperature fluctuations, actual daily sunlight hours (minus cloud cover), relative humidity, shade cloth density and colour (60-90% beige cloth enhances red bromeliad foliage in tropical and sub-tropical climates at least) and growing medium nutrients. The modern polycarbonate sheeting (especially opal white colour) is ideal for many bromeliads not only for its diffused bright light transmission but as Winter protection and this UV-resistant roof cover helps prevent leaf-burn in Summer. Producing anthocyanic tints may

Figure 24. *Neoregelia wilsoniana* dark form.

Figure 25. *Vriesea* "Negro".

be less attainable under artificial lighting indoors. Regular watering and high relative humidity in all seasons also helps prevent burning, as does adequate ventilation to prevent heat build-up. It's fundamentally true also that well-nourished, healthy plants withstand excessive solar radiation better than weak, starved or desiccated plants.

It could be perceived that these dark-leaved bromeliads look lifeless either en masse or singly and, indeed, they can appear sombre when shown this way. However, as companion plants in a mixed display or landscape design, these darkies provide the perfect backdrop by contrast and solidarity to forms with lighter-patterned foliage, notably variegates. In artistic arrangements requiring dramatic or bold simplicity, blackish rosettes or leaves can evoke themes of evil and mysticism. Glossy dark foliage in competition entries invariably needs extra cleaning or pre-wiping as invariably grime and salt/lime deposits show up more otherwise.

The preceding "black list" is not exhaustive and some are difficult to group as they change colour and markings according to where and how they are grown. Literally and figuratively-speaking, this multitude of dark-foliaged bromeliads, often with long-lasting, attractive inflorescences, also vie for a plum role in our collections.

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Erratum

In the article by Maria Solange Dutra da Cruz et al., Journal of the Bromeliad Society 55(2): 89, 2005, the figures captions were not clearly marked. Figure 31 refers to the figure directly below it, while Figure 32 refers to the figure above.

Notes on the Genus *Deinacanthon*

Harry E. Luther, Bromeliad Identification Center

The monotypic genus *Deinacanthon* was established by Carl Mez in 1896 for an anomalous plant that he had described five years earlier as a species of *Rhodostachys* (=*Ochagavia*). In 1967 Lyman Smith combined *Deinacanthon* with *Bromelia*. He reversed his decision in 1988. As accepted today, the genus *Deinacanthon* differs from *Bromelia* by having a simple, few-flowered inflorescence, mucronate sepals (obvious only on dried material), appendaged petals (the appendages are adnate to the base of the antesepalous filaments) and very succulent leaf blades (modfied from Smith 1988).

Deinacanthon urbanianum (FIGURES 26-29) is a terrestrial, native to dry woodlands in Argentina, Bolivia, and Paraguay (Castellanos 1954, Smith & Downs 1979). The most complete account of this species is by Castellanos (1954). He described the flowers as malodorous; I have not been able to confirm this with cultivated plants, perhaps the "cadaverous smell" was the result of fermentation of the copious nectar that the flowers produce. Castellanos also reported that the fibers of the thick, tough and succulent leaves were used to weave market bags.

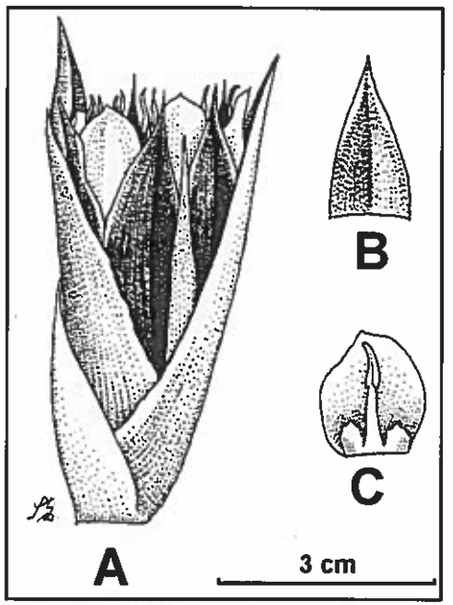

Figure 26. *Deinacanthon urbanianum*. A. Inflorescence. B. Sepal. C. Petal and stamen.

In cultivation, *Deinacanthon urbanianum* requires bright light and good drainage. Plants grown at the Marie Selby Botanical Gardens have been unaffected by short periods of freezing (32°F/0°C). They flower very irregularly, every three to four years, with the inflorescence lasting five or six days. Fruits have, thus far, not been produced but the plants reproduce prolifically by slender 10-15 cm long stolons.

Acknowledgements

I thank Stig Dalstrom for the illustration.

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Figures 27-28. Top left and right, *Deinacanthon urbanianum* grown in full sun at the Marie Selby Botanical Gardens.

Photographs by Bruce Holst.

Figure 29. Deinacanthon urbanianum in cultivation in Australia.

Photograph by Len Colgan.

"Alice in Bromeliadland," The 25th Annual Sarasota Bromeliad Society Show; plus The 9th Annual International Cryptanthus Show (ICS)

Shirley Evans*

This year we were excited to offer two shows at the Marie Selby Botanical Gardens in Sarasota, Florida. A display of beautiful bromeliads, the awesome awards, a bountiful banquet, and the plant sales contributed to a successful and enjoyable event. The Sarasota Bromeliad Society Show had 249 entries with 24 people exhibiting 8 genera and 20 exhibit-only plants. There were an additional 90 artistic and horticultural entries in the ICS.

Sarasota Bromeliad Society Show Winners

Best of Show Horticultural, The Mulford B. Foster Award. *Tillandsia funckiana*. Eloise Beach. Best of Show Artistic, The Morris Henry Hobbs Award - Metal Egret with *Cryptanthus* 'High Voltage' - Larry Giroux. The James V. Elmore Hybrid Award - *Neoregelia* 'Valerie Steckler' - Marty Baxley. The Wally Berg Horticultural Excellence Award - *Pitcairnia burle-marxii* - Michael Kiehl. The Connie Timm Best Miniature Neoregelia Award - *Neoregelia* 'Mo Peppa Please' - Kenneth Phelps. Sweepstakes Award - Stephen Hoppin & Michael Kiehl. Member's Choice Award - *Neoregelia morrisoniana* - Rob Branch. The Bob Whitman Best Cryptanthus Species - *Cryptanthus warasii* - Larry Giroux. The Warren Loose Best Cryptanthus Hybrid Award - *Cryptanthus* 'Midnight' - Gloria Lowe.

* Sarasota, Florida

International Cryptanthus Society Show Winners

The Cryptanthus Sweepstakes Award - Larry Giroux. The Grace Goode Silver Ingot for Best Cryptanthus Horticultural Award - Eloise Beach with *Cryptanthus lacerdae* 'Menescal'. Michael Young Best of Show Artistic Award - Larry Giroux exhibiting a Ceramic Elephant with *Cryptanthus* 'Angel Dust'. The Bob Whitman Best Cryptanthus Species Award - Eloise Beach showing *Cryptanthus lacerdae* 'Menescal'. The Warren Loose Best Cryptanthus Hyrbrid Award - Eloise Beach with *Cryptanthus* 'Sweet Tooth'.

Figure 30. Best of Show Horticultural, Mulford B. Foster Award. *Tillandsia funckiana* entered by Eloise Beach.

Figure 31. Best of Show Artistic, Morris Henry Hobbs Award. Cryptanthus "High Voltage" entered by Larry Giroux.

Figure 32. Best Cryptanthus Hybrid. Cryptanthus "Midnight" entered by Gloria Lowe.

Figure 33. Best Cryptanthus Species. *Cryptanthus warasii* entered by LarryGiroux.

The Bromeliad Society of Broward County, Florida

Jose Donayre (Profile) & Colleen Hendrix (Show Report)*

A Profile

The BSBC evolved from the Bromeliad Society of South Florida when some of their members decided the trip down was too exerting. It started to function on April 12, 1964; it was then incorporated with the state of Florida on March 6, 1965, and achieved membership in the Bromeliad Society International in April 1974.

The Society was organized with 12 charter members and counted a group of distinguished collectors, growers, hybridizers and *aficionados*, reaching at one point more than a hundred members. Many of them, like Nat De Leon and Maggie Pearl, kept membership in both the South Florida and the Broward County Societies. Names like Jim Fisher, the first editor of "the Bromeliad Commentary," Irma Gall, who became the historian in residence, Bob and Jean Burstrom, now in Atlanta, Stan McMillan, Gertrude Cole, Jim Lessley, are among the outstanding members during the 60s and 70s who filled the top positions on the Board. They and many others living in the county provided the Society with a deep reservoir of knowledge, experience and capacity to launch a very successful operation. In the early 70s, the Frazels, Bill at that time living in Miami and Maureen who had migrated from Canada, Polly Pascal and Tom Naylor among others became members and participated actively in the business of the society and became a regular presence in the Board.

BSBC started publishing its official bulletin in 1964 under the name "The Bromeliad Commentary" which lasted for nearly 35 years until it changed to the present "Scurf." The Bromeliad Commentary brought monthly drawings of bromeliads on its cover and articles on cultivation, plants descriptions, new plants, events and a useful section on questions and answers as well as references to articles published in the BSI Journal. Jim Fisher and later Kevin Gray and Stan MacMillan, among others, contributed their artistry to the bulletin.

Monthly meetings were conducted at different places until settling at the Broward Agricultural Extension Building in Davie where it now meets. At the beginning there were no competitive shows organized by the Society, which was limited to lectures, plant displays and sales at its monthly meetings although some of its members participated in the South Florida Society shows that were held in the late 70s. The Society was instrumental in bringing Valerie Steckler, the editor of the current "Handbook for Judges, Exhibitor & Affiliates," to Florida, a visit which resulted in the starting of the first Judges School in Florida after the 1977 Conference in New Orleans.

Today BSBC invites bromeliad experts every month for presentations to the membership on pertinent subjects and to bring their plants for sale. Among some of the early personalities brought to speak at the meetings was Victoria Padilla who had published the only major book on bromeliads in use at that time. Another prominent speaker was Jeffrey Kent from California. Members provide plants regularly for "show and tell" and for a raffle table, which is reviewed by Bill Frazel for identification and description, keeping members informed and well supplied with fine plants. They also bring plants for selling to our avid collectors. Once a year in October, the Society holds an auction of member plants to raise funds. Every two years with the coming of spring, it organizes a full-blown show and sale major event. This is a showcase for members to display their prized plants and for the society to raise funds at the same time that it receives members of other societies as judges or as visitors and numerous local bromeliad enthusiasts. In every non-show year, the Society participates in a Plant and Flower Festival at Heritage Park which, besides being a major opportunity to sell members' plants, helps increase membership.

The Society has volunteered help in local landscaping projects in public places, planting bromeliads at Heritage Park in Plantation, the Tradewinds Park, Sunrise Blvd. in Fort Lauderdale and recently in the patio of the Fishing Hall of Fame building where our last few shows have been held.

At the present time BSBC has a membership of about 70 members and has seen its roster increased by new members in the last few years, a sign that BSBC continues to be a healthy member of the Florida Council of Bromeliad Societies.

10th Biennial Show & Sale

Our 10th Biennial show and sale was a great success; it was held at the International Fishing Hall of Fame in Dania, Florida. We had the best participation of entries of the past years and one of our members, Jim Kerns, who had never entered before, won "Best in Show" (FIGURE 34). Tim Hendrix, our past president won the Sweepstakes and Ann Schandelmayer won the Morris Henry Hobbs Award (FIGURE 35). Three commercial growers participated in sales along with our members selling bromeliads, which turned out to be profitable for all.

We would like to thank all who volunteered and worked so diligently to make this show the best yet. It is our goal to have this show grow in participation from our members in the years to come, along with educating the public about these beautiful plants.

Figure 34. Best of Show Horticultural, Mulford B. Foster Award. *Pepinia sanguinea* entered by Jim Kerns.

Figure 35. Best of Show Artistic, Morris Henry Hobbs Award. Ann Schandelmayer with "Koala's Romp from Tree to Tree."

* Reprinted with modifications from the Florida Council of Bromeliad Societies' Newsletter.

World Bromeliad Conference in San Diego 2006 Tour Information

Robert Kopfstein[9]

As part of the 2006 San Diego World Bromeliad Conference there will be several interesting and exciting tours designed especially for bromeliad aficionados. The region surrounding the conference site is famous as a horticultural Mecca; hundreds of growers and nurseries call the San Diego area home. The climate is the most temperate (the highest lows and the lowest highs) in the continental United States. As a result, conference attendees who travel around San Diego County can expect to see an incredible range of plants which adapt well to the local climate – from cactus and succulents to semi-tropical and some tropical species.

The bus tours are not included in the conference registration fee, and it is wise to pre-register for the tours because the number of buses will depend on how many conference attendees register before the conference begins. Registration forms will be mailed to all registrants in early 2006.

Tuesday, June 6

No visit to San Diego would be complete without seeing the world famous San Diego Zoo. Located in Balboa Park, the zoo covers more than 125 acres landscaped with thousands of exotic plant specimens, palms, orchids, euphorbias, cactus, trees from the tropical climates, and of course bromeliads. It's said that the value of the zoo's plant collection exceeds that of its animals. The recent birth of a baby panda will offer you the opportunity for a close-up view of the results of the zoo's commitment to preserve rare and endangered species.

Included in the zoo experience will be both a bus tour and a walking tour of the zoo grounds. Lunch is included.

Wednesday, June 7

San Diego's only botanical garden is located just a few miles up the coast from San Diego. Originally an estate, Quail Botanical Gardens covers 30 acres divided into gardens representing the various floral regions of the world: Australia, Africa, Madagascar, the Himalayas. It is home to more than 100 species of bamboo (more than in any botanic garden in the U.S.), a subtropical fruit garden, an herb garden, and a rainforest. Several acres are devoted to the California native coastal sage scrub, the most endangered plant community in all 50 states. Lunch at Quail Gardens is included in the tour.

If possible, there will be a stop at Bird Rock Tropicals, a nursery specializing in tillandsias and other bromeliad species.

[9] Vista, California.

Thursday, June 8

The Thursday tour promises to be a bromeliad bonanza. In the north San Diego County area of Fallbrook is the greenhouse complex of Rainforest Flora, run by Paul Isley. The specialty of Rainforest is tillandsias, and seeing how bench after bench of these interesting plants are raised commercially will prove to be an eye-opening experience.

Not far from Rainforest Flora is Kent's Bromeliad Nursery, the largest commercial grower of vrieseas in the United States. The Kent family runs a high-tech nursery that uses meristematic cloning to produce thousands of plants with some truly breathtaking colors, the result of *Vriesea* and *Guzmania* crosses.

John Arden is also very well known for his *Vriesea* crosses. His private garden in Vista, California is also part of this tour. Over several decades John has enriched the bromeliad world with his fascinating and beautiful creations. If you are interested in hybridization John has a wealth of knowledge and hundreds of examples of how the human imagination can produce stunning hybrid plants to delight the eye.

Friday, June 9

The Friday afternoon (12:00 - 6:00 p.m.) tours are on your own, so you will have ample opportunity to check out some of the sights in the greater San Diego area. For the mall addicts there is Fashion Valley Mall, which is within walking distance of the conference hotel: be careful, however, not to overbuy if you are on foot. You may have to carry all those packages back to the hotel. The San Diego Trolley stops near the hotel so Horton Plaza, the historic Gaslamp District (lots of restaurants here: Italian, Brazilian, a Spanish tapas bar...), the ships of the Maritime Museum in the harbor, and Tijuana, Baja, California Mexico are all within easy reach by inexpensive public transportation.

Saturday, June 10

There will be no charge for the Saturday tours to three private gardens. The morning tour will be from 8:00 a.m. - 12:00 p.m. The same tour will be repeated in the afternoon for those of you who would rather not get up with the chickens on a Saturday morning.

Jim Wright's garden, featured not long ago in an extensive newspaper article, is a tropical paradise of palms. Jim's garden reflects his lifelong passion for tropical plants.

Bill Tweet also is a grower of palms, cycads, and orchids. His garden abuts one of the canyons, which interlace the city of San Diego (here's another good chance to check out the native California coastal sage scrub habitat).

East of San Diego is Jennie Wisley's garden in La Mesa, California. Jennie's collection of bromeliads has been in the making for years, and her garden also features her collection of antique odds and ends, which lends an air of whimsy to the garden.

The tours at the 2006 Bromeliad Conference will not only provide some entertaining diversion but they also will offer you a chance to learn about the world of bromeliads and other semi-tropical and tropical flora. You'll find that California plant people are truly enthusiastic about showing off all the plants that grow so well in the local Mediterranean climate.

New BSI Committee Chairs

The BSI welcomes two new committee chairs, for the Conservation and Media Library (formerly Slide Library) Committees.

Conservation Committee Chair: **Pierre Ibisch**. Since 2003 Dr. Ibisch (FIGURE 36) has been a Professor for Nature Conservation with the University of Applied Sciences Eberswalde, Germany, close to Berlin and to the Polish border. Studied biology at the University of Bonn where he started to be fascinated by bromeliads thanks to the lectures of his teacher, Prof. Wilhelm Barthlott. Since 1991 intensive studies of the biodiversity of Bolivia and its conservation. Worked and lived in Bolivia for almost 9 years. Until now, author of almost 50 taxa, about 35 species of bromeliads. Taxonomically especially interested in the terrestrial bromeliads of Bolivia; deeper studies of the genus *Fosterella*.

Figure 36. Pierre Ibisch, new Conservation Committee Chair.

Media Library Chair: **Anthony "Keith" Smith**. Keith Smith (FIGURE 37) was introduced to bromeliads in 1976 by former journal editor Chet Blackburn, a fellow he will probably never forgive for creating the addiction. He joined the Sacramento Bromeliad Society that year and has been unable to escape its clutches, having served as president numerous times in the intervening years. He grows mostly neoregelias and vrieseas in his 40' x 27' greenhouse and actively tries to create further addicts by proselytizing about the plants at society meetings and sending visitors away with boxes of his excess plants.

Figure 37. Keith Smith, new Media Library Chair.

The Medicine Man

Ron Parkhurst[10]

Did you see the movie "Medicine Man" starring Sean Connery? It was a story about a scientist who went into the jungles of South America looking for a plant that could cure cancer. What attracted me to this movie is that they were not looking for just any plant, but a certain bromeliad. Of course, bromeliads being my favorite group of plants, I was somewhat surprised and intrigued. Could there be a bromeliad that really cures cancer? I never gave it much thought until I received an email a year or two later from a lady in Vietnam who was also looking for the bromeliad that cures cancer. I told her that she must be referring to the movie the "Medicine Man" and that it was only a movie. She insisted that there was a bromeliad and that it was in the genus *Ananas*, but she could not name a specific plant. This sparked my interest some, but I never heard anything more until currently.

Recently, I saw an article in the IL WU newspaper about a cancer cure from Pineapple. IL WU is a labor organization in Hawaii and the West Coast of California representing labor in pineapple and sugar industries among others, and I used to sit on the Executive Board of Directors for the ILWU in Maui County. Since Hawaii produces 215,000 tons of fresh and processed pineapples each year, my interest was invigorated again about bromeliads being a possible cure for cancer.

The article went on to say that Australian scientists have discovered two molecules from the pineapple plant that may lead to a new kind of cancer curing drug. The discovery of two protease enzymes, "CCS" and "CCZ", could block the growth of cancer cells while activating the body's immune system. The discovery came about as to why Bromelain had such a powerful effect on animal and human cells. Bromelain is a name given by researchers for the family of sulfhydryl proteolytic or protease enzymes found in the pineapple plant. Protease enzymes work by breaking the chemical bonds that hold protein molecules together. This is the same chemical process that occurs when our bodies digest foods. Because of this ability to break down foods, Bromelain is widely used commercially as a meat tenderizer, to clarify beer (now we are talking!) and tan leather hides! These scientists found that instead of just breaking down proteins that the "CCS" could act to slow the growth of cancer cells by blocking another protein called "Ras". The other molecule called "CCZ" could stimulate the body's own immune system to target and kill cancer cells! The way that both of these "CCS" & "CCZ" molecules work is different than any other drug used in the world's clinical laboratories. These differences could lead to the discovery of a whole new class of anti-cancer drugs or breakthroughs in the treatment or prevention of this and other diseases.

The interesting characteristic of both the "CCS" & "CCZ" molecules is that they are proteases. Proteases are traditionally thought of as degradative enzymes which break down proteins, such as found in the digestive system.

[10] Maui, Hawaii.

Other studies on proteases in disease have centered on their potential to cause damage. Both "CCS" & "CCZ" are the first examples of proteases that have been shown to modulate cell signal transduction pathways and also have specific immunomodulatory activities.

In history, both South and Central American natives have known about the medicinal values of *Ananas comosus*. Spanish explorers documented in the 1400s that pineapple was used for wounds as a poultice and drinking of the juice to aid digestion and cure stomach aches. Bromelain has been known chemically to Western scientists since the 1800s but was not used therapeutically until the 1950s.

Can you imagine the interest in bromeliads if it were indeed the cure for cancer? That it was a healthy supplement for your digestive system? Maybe the saying is correct (slightly modified) after all, "A pineapple a day will keep the doctor away!" Of course I am slightly biased but I think that 100% Maui pineapple is the best in the world and have displayed it more than once at the world BSI conference. It is also interesting to note that Hawaiian pineapple has not been hybridized since the 1940s and that Chester Skotak has undertaken the task of hybridizing the ultimate pineapple for future commercial markets with great success.

Did You Know?

Joyce Brehm, BSI President

The BSI funds Research Grants for the study of Bromeliads through the Research Grants committee and the Victoria Padilla Fund currently chaired by Dr. Gregory K. Brown, Professor of Botany at the University of Wyoming. This fund receives at least $2000 per year from the BSI General Fund and is dependent on donations from our loyal members. We currently have one botany student and one established researcher receiving these grants.

1. "Morphological and molecular systematics of the *Tillandsia fasciculata* Sw. (Bromeliaceae) complex: biogeographical and evolutionary implications." Mr. Brian Sidoti, Ph.D. student, Department of Biological Sciences, Florida International University, Miami, FL.

2. "A study of night-flowering species of *Tillandsia* (Bromeliaceae) in the tropical forest of Los Tuxtlas, Mexico." Dr. Thorsten Krömer, Albrecht von Haller Institut, Systematische Botanik, Georg-August-Universität Göttingen, Göttengen, Germany.

The results of these studies will be published in future issues of *The Journal of the Bromeliad Society*. You can do your part to support bromeliad research by sending a donation to the BSI treasurer (address on inside back cover), care of the Victoria Padilla Fund.

WANTED

Writers & Photographers

The editors of the Journal of the Bromeliad Society seek writers and photographers of diverse bromeliad interests worldwide to contribute to the Journal. Please send your contributions to the editors.

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Moving?

If your address is changing, even if your move is a temporary or seasonal one, you should notify the BSI Membership Secretary four to six weeks in advance. Even when you are temporarily away, your bulk mail is either discarded by the Post Office or, as in the case of your JOURNAL issue, is returned to us at a postage due cost of .99 cents within the USA.

Please send your name, the old and new addresses, and the effective date to: John Atlee, BSI Membership Secretary, 1608 Cardenas Dr. NE, Albuquerque, NM 87110 or by e-mail to membership@bsi.org.

Tillandsia canescens: A Rare Species from the Greater Antilles

Lucia Hechavarria Schwesinger[1]

Tillandsia canescens, an endemic species of the Greater Antilles was described by the memorable Swedish botanist Peter Olof Swartz (1788), as having the leaves linear-erect, the scape gray, erect, and with three spikes. The type specimens from Jamaica are deposited in the herbarium of the Swedish Museum of Natural History (S, Holotype R-6135) and that of the British Museum of Natural History (BM, Isotype). An expanded description of the species, with special emphasis on the inflorescence was provided by Swartz almost one decade later, in his work: Flora Indiae Occidentalis (Swartz 1797). Swartz also described the habit of the plant as an epiphyte found in vegetation near the seacoast. *Tillandsia canescens* is considered a rare and uncommon species in Jamaica, with known populations confined to a small area along the central axis of the island, on limestone ledges, cliffs and crags, rarely on trees, at 2000-3000 feet (approx. 600-900 m) above sea level (Proctor & Read 1972).

The first record of the species outside of Jamaica was made by Grisebach (1866), based on a specimen collected by Charles Wright (No. 3273) in Pinar del Río, Cuba (Howard 1988). Wright (1811-1885) made many plant collections throughout Cuba on his trips between 1856 and 1867. These collections provided the basis of the works "*Plantae Wrightianae, e Cuba Orientali*" (I and II) and "*Catalogus Plantarum Cubensium*", all of them written by Grisebach (1860, 1862, 1866) and also for the *Flora Cubana* of Sauvalle (1873). These works are still valuable references today for students of the Cuban flora.

In Cuba, *Tillandsia canescens* prefers rock outcrops (FIGURE 38) in the western-most province, Pinar del Río, in the highlands of Sierra del Infierno, Sierra de Viñales, and the northern side of Pan de Guajaibón (694 m elevation). It is found in isolated colonies of 3 to 5 individuals in varying stages of growth. The rosettes adhere strongly to the bare rock by means of fine and tough roots (FIGURE 39). The plants are small, reaching 25 cm tall in flower. The dark green leaves are succulent, chartaceous, and flexible, and are densely covered with cinereous scales that, as the Latin name implies, give the plant a grayish aspect. The inflorescence is simple or compound-subdigitate, the scape is thin with foliose and imbricate green bracts; the flowering spikes are short, flattened, to 4 cm long, and with 3-5 flowers. The floral bracts are dark red and contrast nicely with the blue flowers, the green-gray foliage, and the background of lichen-encrusted rocks (FIGURE 40). Flowering and fruiting occurs in January to March. No pollinators have been observed visiting its flowers.

[1] Instituto de Ecología y Sistemática, Carretera de Varona km 3.5, Capdevila, Boyeros. AP: 8029; CP: 10800. Cuba. E-mail: pilarhs@cubarte.cult.cu

Figure 38. Population of *Tillandsia canescens* on the northern side of Pan de Guajaibún, Cuba.

Figure 39. The colors of *Tillandsia canescens* contrast with the naked gray stone.

Figure 40. Flowers of *Tillandsia canescens*.

Tillandsia canescens grows in semi-moist environments, under direct or filtered sunlight. The vegetation surrounding the outcrops is generally shrubby forest, with some deciduous or semi-deciduous emergent trees with open and loose crowns that allow light to penetrate to ground level. Other bromeliads found in the area are *Tillandsia variabilis, T. balbisiana, T. pruinosa, Catopsis berteroniana, Aechmea nudicaulis,* and *Hohenbergia penduliflora*.

Though not officially recognized as threatened in any of the existing red lists, *Tillandsia canescens* would seem to be eligible for listing according to the IUCN (1994). Its populations are fragmented and restricted to an area less than 10,000 km² in Cuba, as well as in Jamaica. I hope that conservationists take note, and help determine the true threat level to this beautiful species.

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The Florida State Fair: A Showcase for Bromeliads

Tom Wolfe[12]

In early February every year at the Florida State Fair, bromeliads are on display in the horticultural building courtesy of the Bromeliad Guild of Tampa Bay.

Many specialized plant societies such as fern, orchid, cactus, etc., are invited to participate. Each Society is given a 12' x 15' area to promote their particular plants, educate the public, and attract new members to their clubs.

There is a judged plant area where specimen plants are entered for judging and then put on display throughout the duration of the fair. Ten to fifteen percent of these plants are usually bromeliads.

The Bromeliad Guild of Tampa Bay (BGTB) participates each year and usually attracts several new members. The 2005 Fair display consisted of a 12' tall pyramid shaped bromeliad tree that rotated via electric motor while a hidden recorder played Jazz to the theme, "Bromeliads and All That Jazz" [FIGURES 41-44). BGTB Members, Dave & Mary Fulkerson and Al Santiesteban designed and built it. It was surrounded by large specimens of neoregelias and aechmeas. A number of club members joined in to install and decorate it.

The Fair also includes a sales area where all kinds of plants are sold from orchids, ferns, cacti and camelias to African violets. The people that participate are from the Clubs that have displays. There are thousands of people that walk through this area during the 12 day duration of the Fair which gives us a great opportunity to sell plants and educate people about bromeliads. In addition to selling, we hand out free literature, sell the BSI cultural manual, and give advice to countless numbers of folks who still insist on calling them brom-a-laids!

The February Fair provides a warm respite for northern citizens to come and enjoy a few days away from frigid temperatures and as a bonus feast their eyes on an array of tropical plants that are only rivaled by a botanical garden.

In addition the BGTB was invited to install another 12' x 15' display in the Florida Agricultural Hall of Fame Building as part of a 60' x 100' display including palms, waterfalls, pathways, and various flowering plants. This display was an opportunity for people to entertain ideas for their yards, patios and other landscaping plants of interest around their homes. Many BGTB members enjoyed installing this display. My own contribution was a bromeliad display in the main entrance of the Family Living Building which houses the horticulture section of the Fair.

Needless to say, the BGTB had a strong presence at the 2005 Florida State Fair and its members are to be congratulated for a lot of creativity, initiative, and hard work.

[12] Lutz, Florida

Figure 41. Bromeliad frame, before being set on rotating device.

Figure 42. Alcides Santiesteban (right), engineer and architect, and his father helping to load the frame & tree. The rotating base of the tree was an engineering accomplishment by Al. The metal base was 7' wide and very heavy.

Figure 43. Mary Fulkerson and the finished display in her garage.

Figure 44. Alan Keller and son greet visitors to the Florida State Fair.

[5] BSI Secretary

The Bromeliad Society International

The purpose of this nonprofit corporation is to promote and maintain public and scientific interest in the research, development, preservation, and distribution of bromeliads, both natural and hybrid, throughout the world. You are invited to join.

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Figure 45. Large tree covered with many kinds of epiphytes. Costa Rica. See article in this issue on a bromeliad-filled trip to Costa Rica by Bruce McCoy.

Figure 46. Spike of *Aechmea veitchii*, growing above the Orosi Valley at the Monte Sky private nature preserve.

Figure 47. *Tillandsia biflora* growing high on a ridge above San Gerardo de Dota.