JOURNAL

OF THE BROMELIAD SOCIETY

Volume 56(4): 145-192 JULY - AUGUST 2006

Journal of the Bromeliad Society

Volume 56(4): 145-192 July-August, 2006

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Cover photographs

Front—José Manzanares making a picture of *Racinaea pulchella* in its habitat. See article beginning on page 150. Photo by Eric Gouda.
Rear—Tillandsias fasciculata, T. variabilis and T. *setacea* in the Fakahatchee Strand, Florida. See article on page 172. Photo by Ken Marks.

Publication Information: The Journal is published bimonthly by the Bromeliad Society International. All scientific articles are peer reviewed, and author guidelines are available from the Editor. Authors are requested to delare any article they have already, or intend to, publish elsewhere.

Editorial

In This Issue

In the editorial section we have a letter from a member in Italy, Alberto Grossi, again dealing with the conservation issue. We also re-introduce a section giving news items from our Affiliated Societies.

Scientific

Two taxonic investigations result in the re-location of an old taxon: *Caraguata pulchella* moved into Racinaea by Eric Gouda, and Harry Luther discovers that plants known for some fifty years as *Guzmania eduardii* were named incorrectly and were, in fact, an unidentified species that Harry has now named "*Guzmania conglomerata*."

In the first article originating from papers presented at the Tillandsia Symposium at the BSI World Conference in San Diego June 2006, David Benzing provides a thorough overview and introduction to how modern taxonomists are using DNA analysis in computer-generated models that illustrate relationships between species. These techniques are said to provide a more accurate picture of evolutionary relationships than older methods based solely on visual assessments of plants.

Cultivation

Derek Butcher reviews another new book, this time an upd the Australian Bromeliad Society's introductory *Bromeliads* . We have a new advertiser, RicSel Orchids from Brazil, whose bromeliad range is well worth a look.

General Interest

In her regular column our President Joyce Brehm remind Membership Directory is available on our society web page, and also in printed form for those of us not having access to the Internet. Sadly we farewell widely respected member Connie Johnson from Florida, page 180.

Webmaster Ken Marks has been travelling the length of Florida seeking out all its native bromeliads, and on page 172 we begin the first part of his intriguing travelogue. Virginia and Robert Guess have uncovered a rather devious method of selling bromeliads by street vendors in Mexico, page 168, that is reminiscent of a practice noticed by Peter and Jeanette Waters in Turkey some years ago —see "Turkish Delight" in *JBS* 50(5) p. 222.

A highly successful and enjoyable World Bromeliad Conference was held in San Diego, and Karen Andreas reports on page 183.

Letters

Dear Editor,

I am Dr. Alberto Grossi from Italy. I am new to BSI from this year but I have been growing plants since I was age 13 and now I am 46. At the beginning I collected all plants I found on the market. Through the years I understood that Nature has to be saved. What to do?

I think that the problem is common in the whole Plant Kingdom. There are some things that common people can do, and some things not. What I, alone, cannot do is about the political approach to Nature: to think of it as a never-ending resource for heating, motoring.... progress is too fast for Nature. What I can do, and I am doing, is not to buy hybrids. I know it is easier to have a single plant that blooms over 10 months than to have 10 plants to cover the same period. But the pleasure to grow them is higher, for me, and not the only goal. To grow only species could be accompanied by a larger demand of new plants from the wild. Here BSI and the other International Societies must work: to make available seeds/seedlings/plants so as to prevent the extinction and to assure a spreading genetic material on the other hand. The Botanical Gardens of Kirstenbosch last year sold about 1200 seedlings of the newly described *Clivia mirabilis* and this has been enjoyed by the collectors and by the specie!

Only by spreading the plants can you save them from extinction. Maybe one day we all together can save our Earth.

My best regards
Alberto

The BSI provides a seed bank exclusively for members. See page 168 for the current listing, containing many interesting species - Ed.

Correction

We showed this photo of a plant labelled *Tillandsia ionantha* 'Huamelula' on page 128 of our last issue, *JBS* 56(3). Bromeliad Identification Centre Director Harry Luther advises that *Tillandsia ionantha* 'Huamelula' is actually *Tillandsia ionantha* var. *maxima* Ehlers. See "Tillandsia ionantha und ihre Verwandten" (*Tillandsia ionantha* and their relatives) *Die Bromelie* **1/2000**, 6-9.

Affiliates News

Florida West Coast Bromeliad Society member Helga Tarver has been awarded the BSI Cultivar Registrar's Special Cultivar's Award. At the presentation last May, Harry Luther and Dennis Catcart also presented Helga with a plant named in her honor, *Portea* 'Helga Tarver'.

The San Francisco Bromeliad Society report earlier this year what is thought to be only the second flowering in cultivation of *Puya raimondii*. It was grown from seed given to the San Francisco Botanical Garden, Golden Gate Park, 33 years ago by plant collector Victor Reiter. The event was not without additional drama—in mid bloom a high wind blew the plant over, but it still mananged to complete flowering.

Congratulations to the Cairns Bromeliad Society who won "Best Club Display" at the Cairns Tropical Garden Show 2006. In true Aussie spirit, their display was titled "Our Back Yard" with the washing lady in front of the house, the fat Nuleaf Man with his wheebarrow full of flowering Neoregelias and surrounded by lots of other bright flowering bromeliads plus an old push lawn mower.

The Bromeliad Society of Australia had another successful Autumn Show May 6-7, 2006. Plant sales were over $20,000, earning them $4,000 for the Society. Show Grand Champion was *Aechmea orlandiana* 'Ensign' shown by Ron Farrugia, and Reserve Champion was *Tillandsia xerographica* from Debbie Hurst.

Carol Hertz, long time president of the Greater New Orleans Bromeliad Society, died on Memorial Day, 2006. BSI director Fred Ross wrote: "Following Hurricane Katrina, Carol evacuated to Alabama. During her return to New Orleans several months later, she fell and broke her shoulder. Insistent that she return to live in her own home and be with her cats, she returned to live on the second floor with the first floor inundated with over 6ft. of water following the hurricane. She lived there for months having neither power nor potable water; she existed on gas generated power and bottled water…. Catastrophe hit again when being home only a few weeks she again fell and broke her other shoulder. You could see that these misfortunes coupled with her diabetes, partial blindness, HBP and inability to walk, eroded her strong personality. With so much despair her generous heart finally just quietly stopped. Carol's life was filled with her cats, bromeliads (many cryptanthus), the GNOBS and her bible. We have all lost a wonderful person and friend….."

The Cryptanthus Society report another heart-breaking consequence of Hurricane Katrina, this time the destruction of Mary Jo and Dennis Kellogg's plant collection of 28 years. The couple had "…amassed one of the largest assortment of cryptanthus ever collected for purchase by cryptanthus enthusiasts" but, following the near total loss, their business D & M Enterprises has closed and will not reopen.

Recognition of *Caraguata pulchella* André as a good species in *Racinaea*

Eric J. Gouda[1] **and José Manuel Manzanares**[2] Illustrations by Eric Gouda.

One of the most exciting plants we found on our trip in November-December 2005 to the south of Ecuador is this very colorful Racinaea, published by Eduard Andé as *Caraguata puchella* in 1888, (not *Tillandsia pulchella* Hooker 1825). It has been depicted with a nice and catching line drawing in the book *Bromeliaceae Andreanae*, by André, plate XVI-A and reproduced in Smith & Downs (1977), see figure 1.

Later it was given the name *Tillandsia mezii* André ex Mez as a new name (*nom. nov.*) for *Caraguata pulchella* André, which could not be transferred to *Tillandsia* because Hooker already used that name before for a different species that became synonymous to *Tillandsia tenuifolia*. Lyman B. Smith at first (1930) recognized this taxon as a variety to *Tillandsia seemanii* (Baker) Mez, but later on in the publication of the Monograph of Tillandsioideae in the Flora Neotropica it was synonymized to *Tillandsia seemanii*, nowdays *Racinaea seemannii* (Baker) M.A.Spencer & L.B.Sm.

Figure 1. Drawing of *Caraguata pulchella* by G. Severyns, from the book *Bromeliaceae Andreanae* (1889)

In the first place the plant resembles a small *Racinaea undulifolia* (Mez) H. Luther, with its dark brown leaf-sheaths forming a narrow bulbous rosette and strongly undulate coriaceous leaf-blades. But the inflorescence is more like that of *R. seemannii*, but much larger, much exceeding the leaves because of it's elongated peduncle and often compound of a few spikes. The flowers are more strongly upward and the floral-bracts are brightly orange, not red and slightly of different form (orbicular and not broadly-ovate.) *R. seemannii* has a more open cyathiform rosette with straight leaf margins.

Excepting *Racinaea undulifolia*, it is

1 Curator Utrecht University Botanic Gardens, The Netherlands.
2 Curator of Bromeliaceae at QCNE, Ecuador.

the most spectacular small Racinaea. The type location is South of Riobamba, Prov. of Chimborazo, Ecuador at 3200 m elevation but at this stage it is unknown if more specimens from that area have been collected. We did found it further south in the Prov. of Azuay, east of Cuenca. It is growing epiphytic in small trees of the cloud forest at about 2950 m. elevation. Below a detailed description of this species is provided.

Figure 2. *Racinaea pulchella* inflorescence and flower.

Figure 3. *Racineae pulchella* in its habitat.

***Racinaea pulchella* (André) Gouda & Manzanares comb. nov.**

Basionym: *Caraguata pulchella* Andre, Enum. Bromel. p.5. **Type**: Riobamba, Chimborazo, Ecuador, André 4502, Jul.1876 (holotype K). **Synonyms**: *Tillandsia mezii* Andre ex Mez, DC. Monogr. Phan.

9:738. 1896; *Tillandsia seemannii* var. *mezii* (Andre ex Mez) L.B.Sm., Contr. Gray Herb. 89:14.1930.

Plant stemless, flowering 15-20 cm tall, 4-7 cm wide, rosulate, forming a pseudobulb, propagating by short stolons 3-4 cm long. ***Leaves*** acute, rosulate, coriaceous, ascending with slightly spreading apex, 9-13 cm long, the outer greatly reduced, shorter than the inflorescence, numerous, ca. 20 , red maculate; sheaths 3-5 cm long, 2.5-3.5 cm wide, conspicuous, contracted into the blades, inflated, ovate, sub-papyraceous, margins hyaline, veination not evident, densely appressed lepidote, with brown indument, brown castaneous; ***blades*** only slightly longer than the sheaths, 4-7 cm long, 0.5-0.8 cm wide, 5-8 mm wide, margins strongly undulate, very narrowly triangular, canaliculate, coriaceous, veination not evident, attenuate and acute, apex spreading, sparsely lepidote or punctulate lepidote, green and flushed red abaxially, slightly maculate. ***Inflorescence*** pendulous, (fertile part) 5.5-9 cm long, 1-1.5 cm wide, exceeding the leaves, simple or digitate, with 1-3 spikes; ***peduncle*** equalling the leaves to exceeding the leaves, 9-13 cm long, 1 (dry)-3 mm in diameter, curved, sub-slender, slightly visible, terete, orange, sparcely lepidote; peduncle-bracts lower ones not foliaceous, erect, ovate, closely clasping the peduncle, imbricate to remote, membranaceous, ca. 2 cm long, ca. 1.5 cm wide, apiculate, orange, sparsely lepidote to densely lepidote toward the apex, even; ***primary-bracts*** like the upper peduncle-bracts; ***spikes*** short-stipitate; ***stipe*** ca. 1 cm long; pendulous slightly S-shaped, oblong, complanate, truncate, dense,

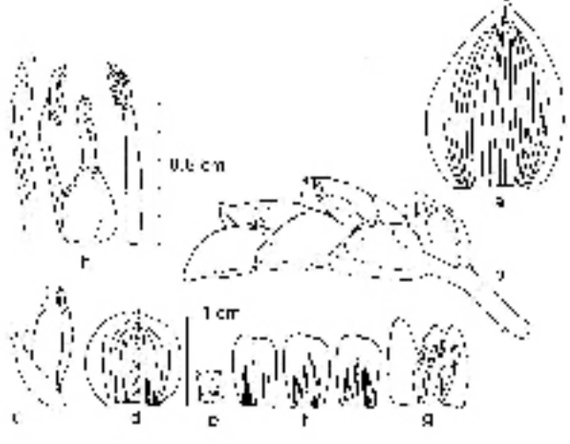

Figure 4.

Drawing of floral details by Eric Gouda.

a. primary bract.
b. branch.
c. flower
d. floral-bract.
e. pedicel.
f. sepals.
g. petals.
h. pistil and stamens.

3.5-8 cm long, 1-1.5 cm wide, 6-15 -flowered, flowers 0.5 cm apart, orange, sparsely lepidote, without sterile bracts or with one sterile bract at the apex; ***rachis*** flexuous, visible between the loosely sheathing bracts, slightly excavated next the flowers, 2 mm in diameter, adpressed lepidote of brown trichomes, pink-orange; ***floral-bracts*** slightly spreading, not secund with the flowers, 11-20 mm long, 11-15 mm wide, exceeding the sepals, two to three times as long as the internodes, not concealing the rachis, loosely sheathing the flower, not imbricate, orbicular to ovate, membranaceous, slightly inflated, apiculate or emarginate, even (nerved when dry), sparsely lepidote of adpressed trichomes, bright orange. ***Flowers*** sub-erect, upward secund, short-pedicellate, about twice the length of the internodes, 1.2 cm large, 0.5 cm apart, white; ***pedicel*** stout, 3 mm long; ***sepals*** 8 mm long, 5.5 mm wide, strongly asymmetric, obovate, thin and fleshy at base, even, ecarinate, free, hyalin in upper half and margins, emarginate and minutely apiculate, abaxial slightly lepidote, white and sometimes tinged reddish; ***petals*** much exceeding the sepals, 0.95 cm long, 3 mm wide, conglutinated, the blade narrow, apex rounded, white, recurving; ***stamens*** included, 0.65 cm long; filaments 0.6 cm long, white, fleshy complanate; anthers 2 mm long, sagittate, apiculate, dorsifixed near the center; ***pollen*** yellow; ***pistil*** 0.5 cm long, shorter than the stamens; ovary 2.5 mm long, ovoid, abruptly contracted into the style; ***style*** 2.5 mm long, short; ***stigma*** lobes twisted together.

Specimen examined: Seemann 898: Loja Ecuador, 1847 (type of *Guzmania* (*Racinaea*) *seemannii* Baker); André 4502: Riobamba, Chimborazo, Ecuador, Jul.1876 (holotype K); Manzanares & Gouda 8167: Prov. of Azuay, east of Cuenca, 2950 m. elevation, Dec. 2005 (QCNE, U).

Figure 5.
Racinaea seemannii.

Acknowledgements

We want to thank Walter Till for his helpful comment and the Royal Botanic Garden Kew for supplying type images for research.

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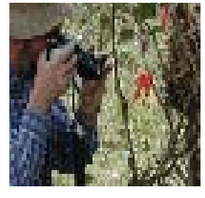

Figure 6. José Manzanares making a picture of *Racinaea pulchella* in its habitat. See front cover.

Bromeliad Society International. Membership Rates

United States Membership (includes bulk mail rate—first class add $10 per year)

	1 Year	2 Years	3 Years
Individual	$30	$58	$85
Dual	$35	$68	$100
Society	$30	$58	$85
Institution	$30	$58	$85
Commercial	$60		
Fellowship	$45		
1st class mail	+$10	+$20	+$30

International Membership (includes Airmail delivery)

	1 Year	2 Years	3 Years
Individual	$40	$78	$115
Dual	$45	$88	$130
Society	$40	$78	$115
Institution	$40	$78	$115
Commercial	$70		
Fellowship	$55		

Life Membership (*one time only fee*) $800.

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What is it that plant taxonomists do?

David Benzing[1]

Readers of this journal are already aware of part of what taxonomists do for a living because they see descriptions of recently discovered species in almost every issue. However, these reports are only part of the picture. The ultimate goal of the botanical branch of the scientific discipline known as systematics and taxonomy is a classification for all plants based on evolution.

Most of the people who pursue botanical systematics and taxonomy concentrate on just small parts of the Plant Kingdom. For those individuals who publish in this journal, the greater goal is discovery of the relationships that tie some 3000 plus species together as members of family *Bromeliaceae*.

Tillandsia illustrates the currently imperfect state of bromeliad systematics and taxonomy. All of the species initially placed in this genus were considered interrelated enough to warrant the same generic assignment: shared morphology seemed to warrant this decision. Unfortunately, similar structure can exist for reasons other than close relationship, which is to say that this genus included, as it still does, species that don't belong so close together in our taxonomic system. Stated somewhat differently, not all of the currently recognized tillandsias are more closely related to each other than to members of several other bromeliad genera.

When new information reveals errors of the kind just mentioned adjustments are obligatory. Corrections include name changes, essentially taxonomic reassignments, that formalize what the researchers advocating the new arrangements believe more faithfully accord with evolutionary history, i.e., phylogeny. Some adjustments require splitting a single genus into smaller ones as, for example, when a portion (subgenus *Pseudocatopsis*) of a formerly more species-rich *Tillandsia* was elevated to become genus *Racinea*. And no change is necessarily correct: the following article, for example, describes evidence indicating that *Racinaea* also is invalid, but more about this below.

When will the current instability of bromeliad taxonomy and nomenclature end, and what will the final product look like? It is these two subjects that provide the focus for this article as they did for my presentation delivered as part of the *Tillandsia* symposium organized by Dr. Susan Gardner at the recent meeting of the Bromeliad Society in San Diego. But we need some preparation before moving on to the business of how to determine the evolutionary relationships upon which the definitive bromeliad taxonomy must be grounded.

1 Oberlin College, Ohio.

The basics of plant naming and classification

First, let's consider why descriptions of recently discovered bromeliads so often appear in this journal. First, it's not done entirely to inform readers about new species. According to the International Code of Botanical Nomenclature, for a newly discovered species to become "known to science", in other words to become "recognized", requires several actions. For starters, the new plant must be assigned a Latin binomial and its defining characteristics recorded as a narrative known as its "diagnosis".

And here is where the journal comes into play. Both the name and the diagnosis of the new species must be published in an appropriate venue, and one such possibility is *The Journal of the Bromeliad Society*. Each species new to science has to be further documented by depositing in a certified herbarium, in effect in a botanical museum, a dried specimen designated as the so-called holotype for that species. Determining evolutionary relationships requires a different approach.

The ultimate goal... is a classification of all plants based on evolution.

The ultimate goal of the discipline of plant systematics and taxonomy has already been identified as a classification of all plants according to their organic relationships. This means that every species, living and extinct, has to be located in the phylogeny that depicts the evolutionary history of the entire Plant Kingdom. Like the genealogy of a single human family, the phylogeny of a genus or of a family of plants or, for that matter, of the entire Plant Kingdom is tree-like when cast in geologic time and depicted graphically. It is tree-like because ancestral species give rise to descendent species during proliferations called adaptive radiations. Proliferations of species are called adaptive radiations because as species multiply, they evolve in different directions some becoming adapted for dry or wet habitats, bird versus insect pollination, and so on.

Once the phylogeny of a group of related species is determined, for example, for the 3000 plus members of Bromeliaceae, the way is clear to discover where and when during its radiation certain key characteristics emerged. Conceivably, explanations for interesting patterns may also come to light such as why some genera are larger or smaller than others, their members more or less drought-hardy, and so on.

Figure one illustrates an abbreviated phylogeny for *Bromeliaceae* indicating where the tank shoot and absorbing trichome first appeared during the adaptive radiation of the family. Note that tanks evolved more than once as *Bromeliaceae* expanded to achieve its current size and diversity, once in the line leading to modern *Brocchinia* and again in ancestors of parts of subfamilies *Bromelioideae* and *Tillandsioideae*.

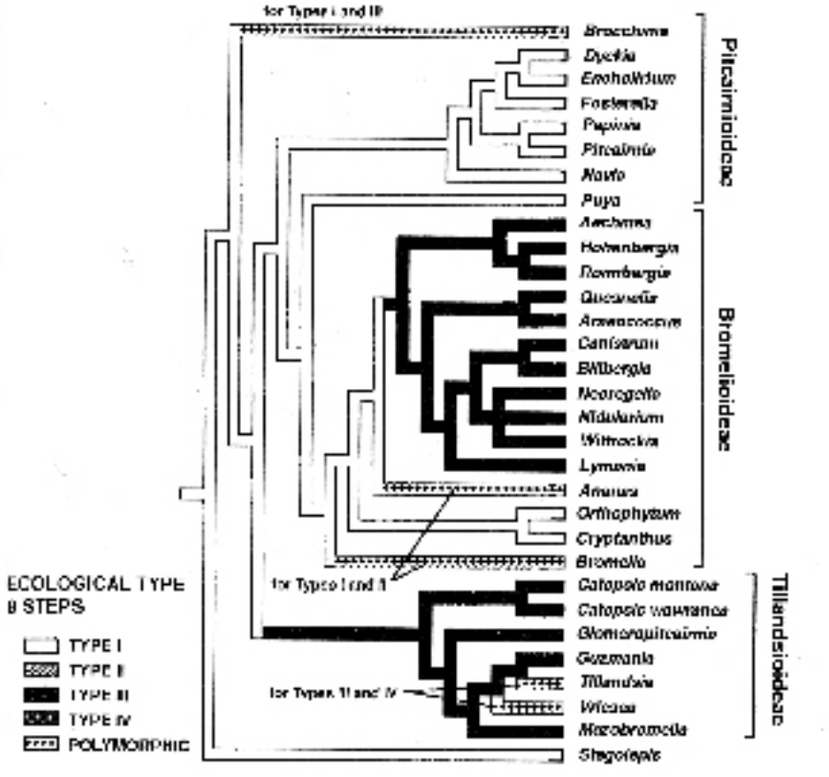

Figure 1. A phylogenetic tree (cladogram) indicating relationships among representative genera and all three of the subfamilies of *Bromeliaceae*. Overlaid are the occurrences of the adaptations that Collin Pittendrigh (1948) used to distinguish four ecological types in the family. Type three species possess large water-impounding tanks while Type four species rely on foliar trichomes to obtain nutrients and moisture instead. The molecular markers used to generate this tree are described in Terry et al. (1997).

Multiple, independent origins of the same characteristics, such as the tank-forming shoot, constitute incidents of what evolutionary biologists call homoplasy. In the case of *Bromeliaceae*, the tank shoot is homoplasious meaning that the presence of this condition in this family does not indicate close evolutionary relationship. Where it otherwise, bromeliad taxonomy as we currently know it would require a major overhaul.

Figure two further illustrates the kind of evolutionary history that taxonomists must discover before they can establish a valid taxonomy, in this case for a hypothetical group of 11 living and one extinct species. This relatively simple phylogeny demonstrates how degrees of phylogenetic relationship determine how species should be

grouped and ranked within the Linnean taxonomic hierarchy shown in the box on the lower right side.

Note how the brackets aligned across the top of the phylogeny group these 12 species into four genera, and these four genera into two families, and the two families into a single order in a way that assures that all of the species included in every taxon in each of the three ranks of taxa share common ancestors. Therefore, every genus, family, and the all-inclusive order illustrated here qualify as clades. A clade then is a collection of species all of which emerged by evolution through geologic time from a common ancestor. Simply put, to be valid, no matter what its Linnean rank a taxon must be monophyletic, i.e., be a clade.

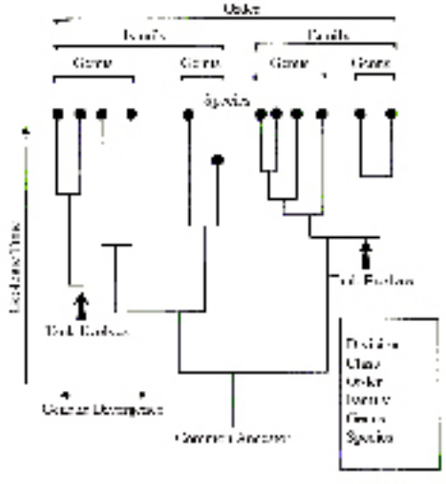

Figure 2. A hypothetical phylogenetic tree depicting relationships among 11 living and one recently extinct species and how these relationships justify the organization of these same species into families and genera according to the linnean taxonomic hierarchy. The tank habit has evolved twice in this clade, i.e., it is homoplasious. See the text for details.

Figure three illustrates how different members of the same group of seven related species can be joined in three distinct combinations to make a genus that either meets or fails the criterion of monophyly. When three of the seven species are grouped as depicted in the upper left corner of figure two they form what constitutes a polyphyletic genus. It's polyphyletic because its members originated from two different common ancestors. The genus containing four species indicated in the upper right corner of figure two is also invalid, in this case paraphyletic. It is paraphyletic because it does not include all of the species derived from the common ancestor of the four species that are assigned to the genus. Only the genus of five species circumscribed within the tree depicted in the lower middle of figure two is nonophyletic and therefore valid. Note that the entire seven member group also qualifies as a real taxon, although to be so recognized, it would have to be granted family rank in the Linnean hierarchy if its species were recognized as belonging to one or more genera.

How does a taxonomist construct an accurate phylogenetic tree despite the potentially confounding effects of homoplasy? What tools are available to infer the evolutionary histories of collections of related species such as the membership of

Tillandsia, or more daunting yet, of Bromeliaceae as a whole? What analytical techniques and kinds of markers are powerful enough to reveal every branch in the crown of the tree that represents the adaptive radiation of a clade comprised of more than 3000 surviving species?

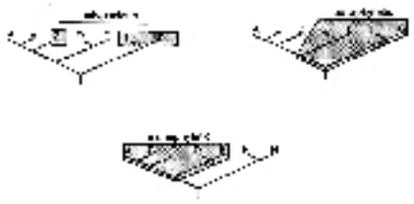

Figure 3.

A hypothetical monophyletic group of seven related species three to five of which are variously combined to illustrate the nature of valid and invalid genera. See page 159 for details.

Tillandsia: its diversity and taxonomy

It would be difficult to identify a genus that exceeds *Tillandsia* for the variety of kinds of habitats occupied by its component species. Nor is another group more specialized relative to the adaptations that underlie its ecological diversity. Members of *Tillandsia* root on bark and rock and in soil under conditions that range from continuously humid to severely arid, in full sun to deep shade, and much more. Some species rely on leafy tanks to obtain moisture and nutrients and others on absorbing trichomes of bewildering structural and functional variety.

Conversely, *Tillandsia* flowers vary much less in form and mode of pollination than those possessed by many comparably sized groups of orchids. Except for weight and size, the *Tillandsia* fruit and seed are even more uniform across the more than 400-member genus. In other words, as the adaptive radiation that led to modern *Tillandsia* unfolded, some aspects of the plant body diverged mightily while others changed little at all.

What caused these disparities in the rates and directions of evolution? Why is *Tillandsia* so successful in forest canopy habitats? When and under what growing conditions did the absorbing trichome achieve its capacity to replace roots in all ways short of anchorage? Answers to these questions, and many more, can only come after someone reconstructs the phylogeny, in other words, the evolution of the entire genus.

Reconstructing a phylogeny

A phylogenetic tree is only as faithful to evolutionary history as the characters used for its construction allow. A "character" in the parlance of the taxonomist is an inherited plant feature that occurs in at least two expressions or character states among the species being compared. For example, flower color qualifies as a character, while red and blue could be two of its states. Characters that change frequently are consid-

ered non conservative. As such, they are poor indicators of phylogenetic relationship, while those that change slowly or less often are more conservative, which also means that they are less subject to multiple, independent changes in the same direction i.e., less prone to homoplasy.

Until about 25 years ago, taxonomists had to rely on characters drawn from plant morphology for taxonomic analysis. The most reliable ones were aspects of the reproductive apparatus such as the numbers of certain parts of flowers, their juxtapositions, fruit type, and so on. Because conditions like leaf shape, hairiness, and size tend to evolve rapidly during adaptive radiations, they proved mostly useless for determining relationships, especially among species that belong to different genera and families and higher ranked taxa. Classifications based on these kinds of markers often contained errors, and for two reasons. They were imperfect because relatively few morphological characters were available to chose among, and of these a significant portion exhibit some degree of homoplasy.

Until about 25 years ago, taxonomists had to rely on characters drawn from plant morphology for taxonomic analysis.

Tillandsia and *Vriesea* were formerly distinguished almost entirely by the presence or absence of a scale at the base of each petal. Now we know that petal scales are homoplasious having been lost and gained more than once during the radiation of this complex of some 600-700 species.

Three recent breakthroughs have greatly increased the taxonomist's ability to apply rigorous analysis. One of them is our capacity to manipulate massive amounts of data using computers. Number two is the development of computer-driven algorithms that construct phylogenetic trees using logic embodied in an approach called cladistic or phylogenetic analysis. The third breakthrough occurred when it became possible to decode DNA. As the actual stuff of genetic relationship, DNA is less prone to homoplasy than characters down stream from the genome like flower or fruit structure, which as the ultimate expressions of genes, help make up an organism's phenotype. Because every letter (nucleotide) in the linear DNA molecules that make up an organism's genome is potentially a character, the number of so-called molecular markers available for use by taxonomists is almost infinite.

The most accurate phylogenies being produced today are based on characters drawn both from gross morphology, as in the past, augmented by DNA code (nucleotide) sequences. Briefly, the relationships depicted in the resulting computer-generated trees or cladograms (in effect their patterns of crown branching) are determined by unequal distributions of derived character states. Cladistic analysis operates on the premise that the possession of shared, derived states of characters by two or more species indicates

that those species are more closely related than if they lacked such commonality. The greater the proportion of derived character states shared by subgroups of species within the full constellation of species being compared, the greater the likelihood of exclusive common ancestry for each of those subgroups.

Cladistic algorithms operate as follows. Prior to analysis each of the species under consideration must be scored for every character used in the analysis according to whether that character exists in its primitive or derived state. The computer then assembles all of the species into "trees" whose branching patterns link them together in plausible evolutionary arrays according to the rule that phylogenetic relationship is evidenced by shared possession of derived character states. Although the computer generates thousands of plausible trees in any cladistic analysis, it's the shortest ones (the most parsimonious trees) that most likely reflect true relationship. Because parsimony is a function of the number of branchings needed to accommodate all of the species included in the analysis, the trees that most accurately depict relationships are presumed to be those with the least branched crowns.

Errors still occur, however, even using the most sophisticated cladistic techniques and carefully chosen taxonomic markers. Determining which of the two states of a particular character is ancestral to the other, for example, is not a simple task. Why would red flowers necessarily be antecedent to those with blue petals within a given genus or family? You can imagine how failure to correctly polarize the states of the characters used for a cladistic analysis will produce inaccurately branched trees. And from an incorrectly branched tree you can only get a flawed taxonomy.

My purpose for writing this article has been achieved if you now have a better idea of what taxonomists do. Having accomplished this goal, you are also better prepared to appreciate what kind of information is embodied in a cladogram, more of which will be appearing in future issues of this journal. With luck, what's ahead will be more than simply improved depictions of bromeliad evolution, i.e., more accurate cladograms. In addition to juxtaposing species according to their true relationships, you will also learn interesting details about the nature of the radiation that produced modern Bromeliaceae and the adaptations that account for its many and often unusual life styles and related requirements for culture.

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Pittendrigh, C. S. (1948). "The bromeliad-Anopheles-malaria complex in Trinidad. 1. The bromeliad flora." *Evolution* **2**: 58-89.

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A new name for an old *Guzmania*

Harry Luther[1]

It's not all that unusual for some tropical ornamentals to come into cultivation before being identified or described as new: several bromeliads are published each year from cultivated specimens. Occasionally a species masquerades as another species and becomes well known and widely cultivated under a pseudonym. The showy *Guzmania* species described here has been grown for half a century and has appeared

Figure 1. *Guzmania conglomerata* from northwestern Ecuador flowering at the Marie Selby Botanical Gar-

in several botanical and horticultural works as *Guzmania eduardii.*

Guzmania eduardii was discovered and described by Edouard Andre. He first published and illustrated it as *Caraguata morreniana* in the periodical Revue Horticole in 1887. In 1896, when Carl Mez transferred this plant to *Guzmania*, the combination *G. morreniana* had already been used for another plant. Mez maintained André's homage to his mentor, Edouard Morren by renaming the plant based on Morrens first name. All this is pretty straightforward except no one, present author included,

1 Bromeliad Identification Centre, Marie Selby Botanical Gardens, 811 South Palm Avenue, Sarasota, FL 34236, USA..

Figure 2. Plate 12 from *Revue Horticole*, Vol. 59 of 1887. This is *Guzmania eduardii*.

has paid much attention to the written protologue and especially the type specimen and original illustration of *Caraguata morreniana*. *Guzmania eduardii* has seemingly not been correctly identified since the late 19th century and the taxon passing under this name has remained undescribed until now. The original illustration of true *Guzmania eduardii* is shown here. Note the very short scape, colorful floral bracts and spreading corolla.

GUZMANIA CONGLOMERATA H. Luther, sp. nov.

TYPE: Ecuador, Los Rios: Montanas de Ila, path following the ridgeline at El Centinela, 600 m elev. 15 July 1979, *C. H. Dodson, M. Fallen & P. Morgan 8423* (Holotype: SEL).

A *G. longibracteata* Betancur & Salinas sed spicis inflorescentia brevis, paucifloris, obovatisque non strobiliformis et bracteis florigeris viridis et albis non rubris et flavis differt.

Plant an epiphyte, flowering to 0.6 m tall, usually clustering. ***Leaves*** densely rosulate, spreading, 4-7 dm long, inconspicuously appressed lepidote throughout, dark green adaxially, purple-red abaxially; ***leaf sheaths*** elliptic, 6-10 cm long, 6 cm wide, very dark castaneous toward the base; ***leaf blades*** ligulate, acute, 2-4 cm wide. ***Scape*** erect to decurved, 6-12 cm long, conspicuously exserted above the leaf sheaths, much shorter than the leaf blades; ***scape bracts*** erect, densely imbricate, the uppermost involucrate about the inflorescence, green to bright red. ***Inflorescence*** densely digitate with 5 to 12 branches; ***primary bracts*** ovate to elliptic, acute, 4-8 cm long, bright red; ***spikes*** sessile, obovate, 4-6 cm long, 6 to 10-flowered, often exuding mucous; ***floral bracts*** densely imbricate, erect, elliptic, broadly acute, 2-3 cm long, very thin, glabrous, green tipped white; ***flowers*** short pedicellate, erect; ***sepals*** elliptic, acute, 20-25 mm long, ca. 1/3 connate, glabrous, thin, nerved, green; ***corolla*** erect, tubular; ***petals*** ligulate, obtuse, 3-4 cm long, 2-5 mm connate, white. ***Fruit*** a dry capsule. ***Seed coma*** brown.

Guzmania conglomerata seems most closely related to *G. longibracteata* Betancur & Salinas (2003) from eastern Colombia. It differs most conspicuously by having the inflorescence branches obovate vs. strobiliforme to cylindric, 4-6 cm long vs. 6-9 cm long and 6 to 10-flowered vs. 15 to 30-flowered. Also the floral bracts of *G. conglomerata* are green tipped with white, not red tipped yellow. This new species superficially resembles the widespread *G. lingulata* (L.) Mez but that species has a simple inflorescence. *Guzmania conglomerata* is a member of the "*G. morreniana* group" of Betancur and Salinas (2003); see that paper for a synopsis but be aware that *G. eduardii* as defined there is the new *G. conglomerata*. Also be aware that all twentieth century illustrations and nearly everything written about *G. eduardii* refer to *G. conglomerata* or to a mixture of characters from both species. For instance, Rauh (1989) illustrated and described *Guzmania conglomerata* (as *G. eduardii*) for the first time for Journal readers.

Figure 3. Guzmania conglomerata in the wild. Photo by Tom Dodson.

Guzmania eduardii has probably not been in cultivation for a century. It appears to be restricted to eastern Colombia and perhaps to western central Ecuador, according to Jose Manzanares, (pers. comm.). In contrast, *G. conglomerata* is widespread in western Ecuador and Colombia in the biogeographic region of the Choco. Because *G. eduardii* is so poorly known it is difficult to know anything about its relationships within *Guzmania*; perhaps it is related to *G. sanguinea*.

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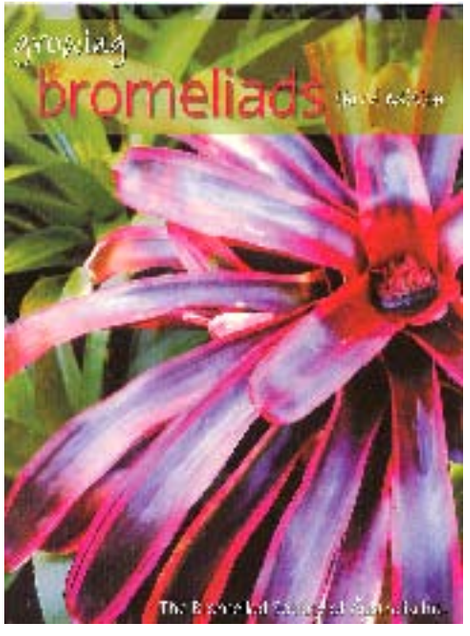
Book review

Derek Butcher, Cultivar Registrar



Growing Bromeliads – third edition by the Bromeliad Society of Australia Inc, 2006, 24cm, 136 pages, soft cover, Kangaroo Press, ISBN.0 7318 1250 6 Cost R.S.P. A$24.95 less 30% to Retailers & Clubs, 36 per Carton. Distributor is HarperCollins Publishers, Yarrawa Road (P.O. Box 264) Moss Vale, N.S.W. 2577. phone 024-860-2900

Things have progressed from the first edition in 1988 and we see a broadening of the scope of this book in line with the current interest of Bromeliads outside the specialised ranks of local bromeliad societies. As such it is a very readable and educational book. The number of coloured photos has increased and I am pleased to see a great reduction in the number of photographs just entitled 'hybrid'. I can think of nothing more frustrating for a reader to think, 'I would like one of those.' - only to find out that nobody knows what you are talking about!

There are some 20 chapters from descriptions within genus to propagation advice, to pests and diseases, and other interesting topics. A good book for beginners and the general public.

A Pseudo Bromeliad from Chiapas, Mexico

Virginia Guess and Robert Guess[1]. Photographs by Robert Guess

Vendor carries his display plant and those he hopes to sell... then they lie in wait for customers in the Parque of San Cristóbal de Las Casas.

Flower vendors in Chiapas have developed a cunning way to market immature bromeliads. Using several plants with unusual clusters of bright flowers to lure customers, they promise that the small plants offered for sale as "bromelia" will develop similar flowers in two or three months if properly planted in soil and then diligently watered. They fabricate their display of spurious bromeliads from a composite of three plants: the bright green rosette of the genus Catopsis; a thick woody scape from an unknown family of plants; and fresh gladiola flowers forced into the scape bracts. Such an innovation may appeal to the unsuspecting public, but becomes an oddity to those interested in natural species, hybrids, and cultivars of *Bromeliaceae*.

We came across these clever entrepreneurs on a sunny Saturday afternoon in San Cristóbal de Las Casas along the *Andador*, a pedestrian walkway that provides itinerant vendors with a lucrative spot to sell their wares. On this particular day, several caught our attention. Each vendor carried a plastic pot containing three or four "flowering"

1 Santa Barbara, California.

plants surrounded by several young ones. From a distance, the leafy rosette resembled a species of *Catopsis*, but the cluster of flowers emerging from the leaves was definitely not an inflorescence from any bromeliad. In addition, each man had a large cardboard box supported by a rope over his shoulder containing more than a hundred small plants of *Catopsis*. Even though all appeared to be of the same species, we noticed that the vendors had divided the box into six compartments.

These colorful flowers act as a lure to attract potential customers.

Care instructions for the small plants...

The colorful potted display first attracts the attention of potential customers. Once drawn into admiring the flowers, the vendor then encourages them to choose a small plant from the various sections of the box arranged by the color of flower he purports will eventually emerge: white, red, fuchsia, yellow, lavender, or blue. Each costs twenty pesos, less than two dollars in United States currency. Traveling from town to town, these vendors ply the streets with their boxes of young plants and flowering examples, usually in June near the start of the rainy season when catopsis are abundant in the forests but have not yet flowered.

After engaging one of them in conversation and expressing interest in his products, we tugged at the various parts of the display plants, puzzling over how such a composite had been constructed. With a few subtle attempts, we were unable to dislodge either the central scape holding the flower cluster or any of the flowers. After some coaxing and then negotiation over a price, however, he agreed to sell us his single pot of three blooming plants. His consent surprised us, since he could no longer entice further customers without it. Perhaps he agreed because it was late in the afternoon or he was ready to close up for the day.

We then took the prize home for further examination. We discovered the plant body

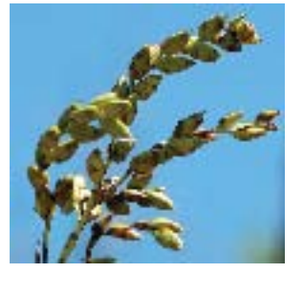
was a *Catopsis* species, composed of twenty healthy leaves, some forty centimeters high. The scape which required considerable force to remove consisted of dense woody material, thirty-five centimeters long, with tight bracts. The distal end of this scape had been carved to a sharp point and then driven into the heart of the rosette. The gladiola flowers were individually inserted deep into the tight scape bracts so they were held firmly in place and difficult to break loose. The flowers lasted for four days, but the damage caused by the scape inserted into the center of the rosette will no doubt deter the development of an inflorescence.

This pseudo bromeliad consists of parts from three plants, only one of which is a true bromeliad: the rosette of a *Catopsis* species, a scape from an unidentified plant, and gladiola flowers.

This report is not intended as a whimsical anecdote, but rather as an alert to methods entrepreneurs employ in constructing plants to entice customers. Furthermore, it documents a large-scale harvesting of young bromeliads which have little chance of survival under the growing conditions that the vendors recommend. For those that may develop, their owners who expect vibrant showy flowers will be disappointed with the emergence of the small yellow or white flowers typical of most *Catopsis* species.

For readers not familiar with typical Catopsis flowers, compare the gladiolus to this one!

Original photo of *Catopsis berteroniana* by Ken Marks, fullsize on page 179 - Ed.



Florida Bromeliads: A Modest Quest. Part 1

Ken Marks, BSI Webmaster

Origin of a Quest

The flashing light on my telephone's handset alerted me to a new message on my answering machine. Chuck McCartney from the Broward County Chapter of the Florida Native Plant Society had called to see if I would speak to their group about the native bromeliads of Florida. Chuck knows more about the native wildflowers of Florida than anybody I know and as a result is also a very popular speaker. He was about to cobble together a new presentation on the bromeliad flora of Florida when he remembered coming to one of my talks on that very subject several years ago. This was the motivation for his call and the origin of my quest to see all of Florida's native bromeliads.

The plant society was interested in a program on bromeliads as a prelude to an upcoming "swamp walk" through the Fakahatchee Strand. I had slides of the more common species found in south Florida but I didn't have too many images of the rarer species which are limited to specialized habitats. Since their meeting room came equipped with a computer and LCD projector, I could bring my presentation on a USB flash drive (memory stick) instead of lugging around trays of slides. More importantly, by converting from an "old school" slide show to a "high-tech" digital presentation, I could augment my images with ones borrowed from the Internet. I gave my presentation with special emphasis on the species found in the Fakahatchee and the following week my wife, Tammy, and I accompanied the group on their field trip.

The group met up at the Fakahatchee Strand park office and then drove north on the graded limerock road enduring ruts and dodging potholes along the way. We left our cars at the grassy parking area along the road, applied copious amounts of bug spray and, with walking sticks in hand, turned off the road and into the swamp. The first part of the trip is relatively civilized as we followed along an old tram road that was used from 1944-1954 when the area was heavily logged for cypress. These tram roads are like ribs that run perpendicular from both sides of the main road at regular intervals. Walking along the grassy trail down the middle of the raised tram road under the shadow of some of the last of the incredibly tall native Florida Royal Palms (*Roystonea elata/regia*), I spotted the first interesting bromeliad. Up in a tree hiding in the shade was a *Tillandsia pruinosa*, the "Fuzzy Wuzzy Airplant", with shiny green seed pods extending from its faded inflorescence. This was a good omen as we had scored one of the more elusive species before even getting wet.

We finally got to our jumping off point and prepared to get amphibious. The

water is always deepest right along the tram roads as that is where they borrowed the fill to build up the road when it was constructed. There was no option here to creep slowly into the cold, still, black water as you might do while wading into a chilly lake. The gasps of those who entered before you don't make it any easier and the clamor of those following you can be heard breaking the otherwise still calm. This is one time when it pays to be taller as you sacrifice less area of dry clothes to the water than the others. I keep my camera in a dry bag when I'm not using it as there are always submerged branches and cypress knees lurking in the dark, tannin-rich water waiting to snare the unsuspecting tramper.

Figure 1. Bocan Raton Bromeliad Society Treasurer and Webmaster Tammy Marks braves the waters of the Fakahatchee Strand.

As we picked our way between the trees we used our walking sticks for stability and to probe the water in front of us for trip hazards since our eyes were incautiously directed upward searching for epiphytes on every trunk, limb, and branch. We saw plenty of ferns, peperomias and orchids along the way in addition to a few of the less rare bromeliads such as *Tillandsia usneoides*, *balbisiana*, *fasciculata*, *utriculata*, and *variabilis*. Outside of a cypress slough *Tillandsia variabilis* is quite rare but in there, over the moist, temperature-moderating waters, *variabilis* is one of the most common bromeliads to be found. Growing reddish where it receives stronger light and green elsewhere, this

Figure 2. *Tillandsia fasciculata* form with totally red bracts., Fakahatchee Strand.

softer-leaved tillandsia formed small clusters or covered tree trunks with small individual seedlings.

As we got further from the tram road and deeper into the heart of the slough, we came across some nice clumps of *Guzmania monostachia* (too early in the season to be in bloom but still with ripe seed pods from last year's flowering). When we got into the guzmania habitat it was an indication to keep a sharp eye out for the other two soft, green-leaved species found here. This was catopsis territory and before long we ran across some nice clusters of the rare *Catopsis nutans*, some dehiscing fluffy white seeds from their opened seed pods. We were there 6 months from this species' blooming season. Even if we had made this trip in the fall we still probably would not have seen its flowers. This species is a night bloomer so, like the more famous Ghost Orchid (*Dendrophylax[Polyradicion] lindenii*), it is probably pollinated by a moth. Whatever species pollinates *nutans*, it is obviously not as highly specialized as the Giant Sphinx (*Cocytius antaeus*) that services the Ghost. This moth has a 6-inch long proboscis which enables it to reach the end of the Ghost's elongated nectar spur. In addition to the treasure trove of *nutans*, we also spotted a single plant of *Catopsis floribunda*, easily distinguish-

able from *nutans* by it larger size and greater number of leaves.

This foray into the swamp netted quite a few improved images for my presentation and kicked off the series of trips that followed on my quest to "bag" all of Florida's native bromeliads.

Figure 3. *Tillandsia balbisiana* in the Everglades National Park.

Trip to the Glades

We had seen two of the three Florida catopsis species in the Fakahatchee where they are most common but had not spotted the largest, *Catopsis berteroniana*, as it prefers brighter, more open habitat. I made some inquiries and it was Chuck McCartney who came to the rescue with some reconnaissance that *berteroniana* could be found on

Figure 4. *Tillandsia fasciculata* var. *densispica* forma *alba* (left) and *Tillandsia paucifolia* in the Everglades National Park.

the small hammocks (or "islands") of trees off the main park road in the Everglades National Park. We charged the camera batteries, packed the camping gear, and headed off the very next weekend for the Glades.

After setting up camp at the Long Pine Key campground we returned to the main road through the park and stopped at every clump of trees that rose above the surrounding sawgrass marsh and was within walking distance from the car. As I traipsed around the border of each of these tree islands, my better (and smarter) half rested in the cool comfort of the car. I spotted a fair bit of *Tillandsia fasciculata*, *utriculata*, and *balbisiana* as well as the ubiquitous *recurvata* and *usneoides*, but I was not seeing the telltale light green foliage of *Catopsis berteroniana*.

A little farther into the park the habitat changed; the pines and oaks gave way to an area of dwarf cypress. My friend Craig Morell and I have a joke about the "dwarf" cypress. Many people have tried to convince him that these are a special, slow-growing miniature variety of cypress. The reason for their bonsai stature is, in fact, due to the incredibly nutrient-poor marl prairie habitat in which they are growing. These plants are nearly lithophytic as they grow directly on the limestone marl, which has very little peat buildup, limiting their access to organic material. In early April when we were there, it was the middle of the dry season and there was no water covering the limestone — only crunchy, dried sawgrass leaves and desiccated periphyton algae.

Figure 5. *Tillandsia flexuosa* (left) and *Tillandsia utriculata* in the Everglades National Park.

While driving through this stunted forest I spotted something out of the corner of my eye which caused a reflexive twist of the steering wheel as I came to an abrupt stop near the object of my interest. At the top of one of the cypresses was a large clump of *Tillandsia fasciculata* var. *densispica* f. *alba*. One of the plants in the cluster was in bloom and I could see by the bright lemon yellow bracts that it matched the alba form that was formally described by Mulford B. Foster in this publication back in 1953 (where it also appeared as the cover image). This plant led to a further discovery as it was soon apparent that the surrounding "dwarf" cypresses were inhabited by dozens of *Tillandsia paucifolia*. None of the individual plants or small clumps that I checked was blooming but several were starting to show some signs of the central leaves elongating and blushing a faint pink. I took a GPS waypoint to mark the exact spot and made a note to return sometime soon in order to catch this species in bloom.

A very short distance down the road we came to a promising looking cypress head which beckoned me with clumps of epiphytes clearly visible from the road. While *berteroniana* was still eluding me, this cluster of trees did net some unexpected riches. The area was dominated by hundreds of large *Tillandsia balbisiana*; several clumps of *T. fasciculata* were evident as well. More interesting though were the plants that appeared to be intermediate to these two species. I had stumbled across a bonanza of *Tillandsia* ×*smalliana*, the naturally occurring hybrid of these two species, and in an incredible stroke of luck, the hybrids were even in bloom! The red inflorescence resembled that of a *fasciculata* but it was greatly elongated and had thinner bracts due to the influence

of *balbisiana*. The rosette of leaves also resembled the *fasciculata* parent but the *balbisiana* presence was apparent in that there were fewer leaves which were more reflexed and which formed a bit of a pseudobulb at their base. To my eyes, some of these plants seemed to be more like one parent than the other. Whether this was the natural variation inherent in the primary cross or whether some of the hybrids had back-crossed to the parent species forming a hybrid swarm is a mystery well beyond my present level of expertise on the subject. It is interesting that before ×*smalliana* was recognized as a natural hybrid by Harry Luther in 1985, it was regarded as *Tillandsia polystachia,* a similar-looking species not actually native to Florida.

Figure 6. *Catopsis berteroniana* in the Everglades National Park.

It seemed that we were going to strike out in our search for *Catopsis berteroniana* but we were mollified by our other discoveries. We decided to continue farther down the main park road toward the town of Flamingo at its terminus. We hoped that a quick rolling survey of the different habitat types through which we drove might provide some ideas as to where we should spend time hunting on the following day. The cypress gave way to an area of small, dispersed Red Mangrove (*Rhizophora mangle*) trees. Further along Paurotis Palms (*Acoelorrhaphe wrightii*) became more frequent. When a line of trees closed in on either side of the road, it limited our view. We had been puttering well below the speed limit while gaping through the windows at the surrounding landscape. We now sped up to the posted speed limit of 55 MPH in order to make our way through this area of obscured visibility. Suddenly Tammy shouted "Stop, I think I see one!" In response, I jumped on the brakes. There were so few cars on the road that I could drive slowly backward on the main road with impunity. When we arrived at the location that she indicated, we spotted our first *Catopsis berteroniana* high up in a tree along the road.

We parked and jumped out in order to photograph this plant and to look for more of the same. Once we had the proper search image, we started to spot additional *berteroniana* with increasing frequency. It also probably helped that we were finally in what seemed to be its preferred habitat. Most of the plants were pretty high up in the upper branches of the trees. Even though I climbed as high as I could into the trees it still required my telephoto lens to bring them into range. I told Tammy that it would be nice to find one on a lower branch as I wanted to get a photo from eye level instead

of from underneath. Within minutes we had located just such a plant and I did my best to immortalize it digitally. Tammy said, "Are you happy now?" and I responded that it would be REALLY nice to find one low down AND with an inflorescence. Shortly thereafter my request was once again granted when I spotted something lying in the debris under one of the trees. It turned out to be a broken branch with a *berteroniana* attached that had a nearly meter long flower spike emanating from its center. I propped this branch in one of the trees so that I could take a picture of the plant and its inflorescence upright. Right next to where I placed the branch I noticed a full-sized *Tillandsia flexuosa* with some rich chocolaty coloration on the leaves due to the strong sunlight — what a bonus!

Figure 7. *Catopsis berteroniana* in the Everglades National Park: inflorescence.

As I wandered along the side of the road contemplating what I should ask for with my third wish, I noticed that a road crew had been through the area recently cutting back the foliage that was encroaching on the grassy shoulder. Looking at the black sap oozing from the cut branches of the trees I had just been climbing in, the warning from Chuck McCartney's email came back to me in a flash, "Be careful because there they often grow in Poisonwood (*Metopium toxiferum*)". Arrgh! I had been crawling all over poisonwood like a kid in a playground. This plant can be identified by the glossy green leaves with a yellow mid-vein but the more obvious feature is the black, toxic, blistering sap that exudes from the trunk, branches and leaves, especially where they have been damaged. To add insult to injury, it was at that very moment that I realized I was standing knee-deep in the poison ivy that formed much of the undergrowth around the poisonwood.

Talk about a novice; in my exhilaration at locating *berteroniana*, I had done everything short of rolling naked in a fire ant mound to ensure dermal disaster! I quickly used up my third wish hoping that I could somehow miraculously escape the ensuing blistering and following weeks of itching. After retrieving some clean clothes from the trunk, I carefully peeled off my toxic threads and redressed in less nocuous attire. We then headed off for the nearest rest stop so that I could wash up as best as I could. Trying not to contaminate anything, Tammy drove as I sat in the passenger seat, hands held upright like a freshly scrubbed surgeon waiting to don his latex gloves. In retrospect, latex gloves probably wouldn't have been a bad idea. Apparently my third wish worked since I came through this ordeal without a single blister or rash.

In Memorium. Connie Johnson

In June of this year the bromeliad world of Florida lost a stalwart member with the passing of Connie Johnson.

Connie joined Fairchild Tropical Botanic Garden in the 1970s and attended classes on bromeliads given by Nat DeLeon. She joined the Bromeliad Society of South Florida and – with Linda Evans – started the society's newsletter, the BromeliAdvisory, setting a high standard which subsequent editors have striven to match. Later she herself taught a class on bromeliads at Fairchild and recruited new members to BSSF.

As Connie accumulated bromeliads, she quickly decided the spineless plants were for her, concentrating on Vrieseas and Guzmanias. Her attention to detail, evident in her editorship, was also apparent in her care and grooming of her plants. Always a perfectionist, she expected her show entries to win Awards of Merit – otherwise they were entered for display only! They frequently ended up on the head table.

Connie was an active member of the Bromeliad Society of South Florida, holding the position of president (four years), vice president, director and show chairman. She was one of those essential people who made the BSSF a model society for other societies in Florida. Connie was a kind and approachable source of information, encouragement and advice to bromeliad neophytes, imparting her love and knowledge of bromeliads to all. She was among the first group of accredited Florida BSI judges and traveled the state judging other societies' shows. She was also judges chairman at BSSF shows.

Connie bequeathed her collection of plants and books to BSSF.

Moyna Prince

Did You Know?

Joyce Brehm, BSI President

You can go online any time of the day or night to review, save, print and read the current Membership Directory? The BSI, due to monetary constraints, has not published a hard copy of the Membership Directory since 1999. However, Ken Marks, Web Master extraordinaire and the Membership Secretary, newly elected, Dan Kinnard have worked together to keep the Directory updated and online. The directory is updated every six months. The "Members Only" section of the www.bsi.org web site can be accessed by using the username and password on the back inside cover of the last *Journal of the Bromeliad Society*. If you do not have access to an online computer, you may request a printed copy (8½"x11") of the directory from the Membership Secretary by addressing a letter requesting it to Dan Kinnard, 6901 Kellyn Lane, Vista, CA—92084, USA.. A directory will then be mailed to you.

The online Membership Directory is as current as the information we have. Please check to ensure your information is correct. We are lacking some email addresses and some changes of address and telephone numbers as well. It would be helpful if each member were to check the information and notify the Membership Secretary at *membership@bsi.org* or mailing the change to the Membership Secretary at the above address with the correct information.

Additionally, we want to again thank the Corpus Christi Botanic Gardens for donating the John Anderson CD for sale from the BSI Publications Chair. Currently we have sold 11 of these CD's and presented one to the BSI Library, currently housed at Marie Selby Botanic Gardens, Sarasota, Florida. Proceeds from this donation are used in support of the work of Harry Luther, Director of the Bromeliad Identification Center, also housed at Selby.

Donations to this worthy cause help the Bromeliad Society International, Inc. support ongoing identification of Bromeliad species. We are here to serve our loyal members. Let us know if we are not fulfilling our mission.

Bromeliads on the Border

Karen Andreas[1]. Photos by Michael and Karen Andreas.

The San Diego Bromeliad Society hosted Bromeliads on the Border, the 17th World Bromeliad Conference, this past June at the Town and Country Resort. Flanked by steep hills on one side, an upscale mall on the other, and restaurants, this garden-style resort was a convenient gateway to the many sights of beautiful San Diego. The members of the San Diego society worked diligently to create a hospitable conference and good time for everyone.

The Mulford B. Foster Award for Best of Show was awarded to *Billbergia alfonsi-johannis* shown by Joyce Brehm.

The BSI held its annual board meeting on the Tuesday before the conference. Its most momentous decision was to declare Australia as the site of the next world conference. Lynn Hudson made the offer on behalf of the Australians and was thereafter

1 Merritt Island, Florida.

seen always with clipboard in hand, making notes and interviewing people. The Judges School also was held on Tuesday and was well attended.

Luncheon for Conference registrants: the official opening of the Conference.

Display by South Bay Bromeliad Associates, California.

Mulford B. Foster Best of Show, Commercial; awarded to x*Nidumea 'Penumra'* shown by Michael's Bromeliads.

On Wednesday as the show was being set up and entries accepted, Dr. Sue Gardner-Sill coordinated the panel of speakers for the Scientific Seminars, which for this conference was a Tillandsia Symposium. The distinguished panel included Dr. David Benzing; Dr. Adolfo Espejo Serna; Dr. Walter Till; Brian Sidoti; Carolina Granados Mendoza; Lucia Hechavarria Schwesinger; Len Colgan; and Dr. Ivon M. Ramirez-Morillo. The Symposium culminated in a lively round table discussion, lead by Dr. Gardner-Sill.

Wednesday was a busy day, with the Newsletter Editors and Affiliates Meeting in the afternoon as well as the Reception for the International Members, sponsored by Tim and Thelma O'Reilly. The day ended on a high note as everyone was treated to a program by Harry Luther on "Some South American Bromeliads and their Habitats." The room was packed and the evening came to a close on a noisy and excited note.

As the judges and clerks went to work on Thursday morning, vendors were busy in the sales area and conference attendees were rolling in. BSI president Joyce Brehm officially opened the conference at the Registrants Luncheon, an Italian buffet served al fresco in the temperate San Diego afternoon. Reunions were happening everywhere, especially, it seemed, at the table full of decadent desserts. Reginald Deroose kicked

off the conference programs by giving the first seminar, "Some Surprising Plants!" The fun had begun! After some generous libations, the sales area opened on Thursday night, and everyone charged in, ready to buy! There were great member sales and a great selection of commercial vendors, including: David Shiigi, Bromeliads Hawaii; Paul Isley and Jerry Robinson, Rainforest Flora; Grant Groves, Color Zone; Michael and Donna Kiehl, Michael's Bromeliads; Reginald Deroose, Deroose Plants; Stephen and Kathy Littlefield, Underhill Studios; Michael, Larry and Jeffrey Kent, Kent's Bromeliads; Brian Weber and Ray Coleman for Dennis and Linda Cathcart, Tropiflora; Naomi Stewart, Aussie Gold; Enrique (Henry) Cortes, Plants on the Rocks. Sales were so brisk that a few vendors almost sold out that first night.

For the next three days, conference attendees had an array of marvelous things to do. Viewing the judged show was a multi-day event in order to do it full justice. There were tours of nurseries, private gardens and one to Mexico. There was a tremendous line up of speakers: Bruce Holst; Tom Knapik; Jeffrey Kent; John Arden and David

Other Show Winners:

A Division XII, *Orthophytum glabrum* shown by Joe Quijada.
B Division III, *Neoregelia* 'Donger' shown by Ted Johnson.
C Best New Cultivar and Breeder, hobbyst: *Neoregelia* 'Sunday Picnic' shown by Sharon Petersen.
D Section IIA, *Aechmea phanerophlebia* shown by Tom Knapik.
E Best New Cultivar and Breeder, commercial: *Quesnelia marmorata* variegated shown by Michael's Bromeliads.
F Division VIII section A, 'Mission San Bromal' shown by Jackie Johnson.
G Best Tillandsia, *Tillandsia juncea* shown by Ted Johnson.
H Division V, Horticultural Display of Single Bromeliad *Tillandsia xerographica* shown by Rainforest Flora.
I Section IA, *Tillandsia deppeana* X *imperialis* shown by Pamela Koide Hyatt.
J WBC 2008 Chairman *Lynn Hudson* (right) introduced by President Joyce Brehm.

Division I winner, *Cannistrum triangulare* shown by Roger Lane.

Shiigi; Paul Isley; Peter Wan, Kay and Joe Quijada; Len Colgan; Phil Bunch; Grant and Magali Groves; Olive Trevor; Ivon M. Ramirez-Morillo; Cristy Brenner; Jackie Johnson; and Jeff Sorensen. Olive Trevor set the stage for the next conference with her program on growing bromeliads in Australia.

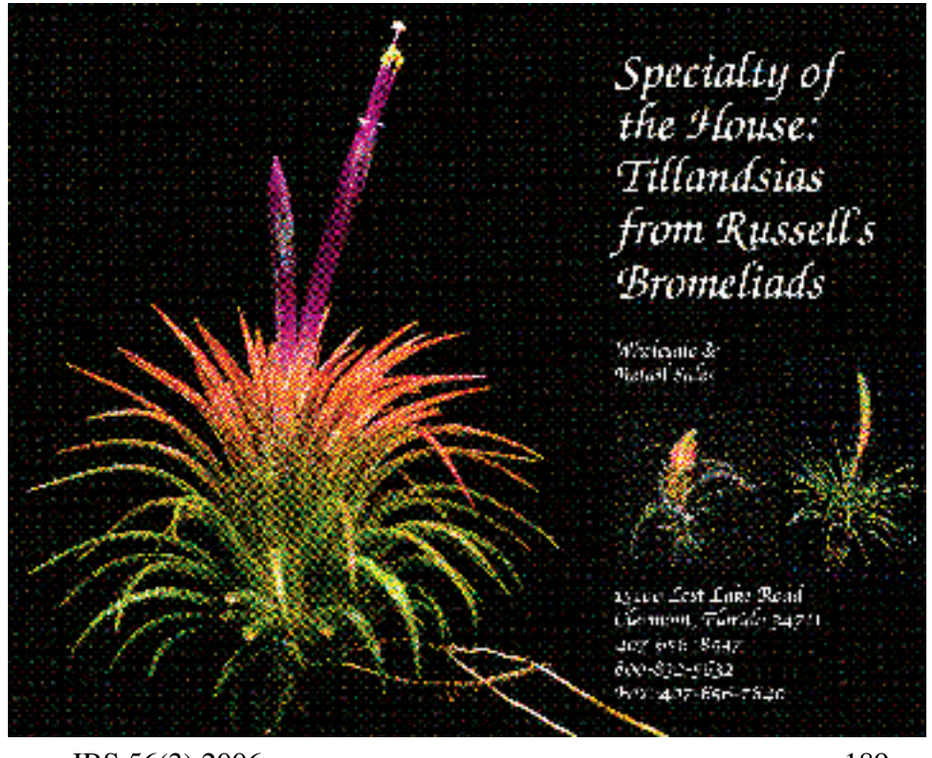
The John Anderson Memorial Rare Plant Auction was held in a packed house on Friday night, with professional auctioneer (retired) extraordinaire Mary Wittemore at the helm, for her second time at a World Conference Auction. With the able assistance of her daughter Marina, she kept the money moving and improving throughout the evening, as she kept the rowdier elements in line with good humor and a bit of mothering thrown in and coaxed the dollars out of reticent pockets. The lively crowd raised about $11,500.00 to benefit the Mulford B. Foster Bromeliad Identification Center at Marie Selby Botanical Gardens in Sarasota, Florida. More than one hundred items were offered at Saturday's Cryptanthus Auction, including rare and collectible species, first release hybrids from Carole Richtmyer and Jim Irvin, and works of art. Mary and Marina reprised their roles as auctioneers for this event; more than $3000.00 was raised for the Cryptanthus Society. Dr. Larry Giroux, Cryptanthus Society editor,

expressed his gratitude to the generosity of the bidders and to the BSI and the San Diego Bromeliad Society for their assistance in coordinating this auction.

On the last evening of the conference, the banquet, a Mexican buffet, was held *al fresco* as conference attendees gathered en masse for the last time. The Magical Hawaiian Musicians, David Shiigi and Rusty Luthe, entertained with their guitars. Uncle Henry Turner, a master on the horn, sat in and the Musicians finished with a get-down rendition of Motorcycle Mama. Joyce caught Herb Plever not only off-guard but speechless as she announced that the BSI board voted him as an Honorary Trustee of the BSI in recognition of his many years dedicated to bromeliads and bromeliad education. Ray Coleman accepted the Hybridizer Award for Dennis Cathcart, in recognition of the number of hybrids that Dennis has registered. The Wally Berg Award was given to Harry Luther for his work as the Director of the Bromeliad Identification Center. While there still was a half-day left to the conference and two excellent seminars to go, the buzz was in the air over the next World Bromeliad Conference in 2008.

In the meantime, congratulations to the San Diego Bromeliad Society, the BSI and all the volunteers who made this such a good conference. As David Shiigi likes to say, we remember the good times together.

See you in Cairns!



EVENTS CALENDAR

Australia

October 14-15, 2006. Bromeliad Society of Australia Spring Show. Venue: Burwood R.S.L. Club, Shaftesbury Road, Burwood NSW.

October 28-29, 2006. Bromeliad Society of New South Wales Spring Show. Wellbank Street, Concord.

November 11-12, 2006 Bromeliad Society of Queensland 2006 Bromeliad Bonanza--combined show and sale of bromeliads. Venue: Mt Coot-tha (Brisbane) Botanic Gardens Auditorium. Saturday (11th) 8am-4pm Sunday (12th) 9am-3pm. Entry $3 adults, children under 14 free. Enquiries Bob Reilly (phone 07 3870 8029).

November 18-19, 2006 Hunter District Bromeliad Society Annual Show. Venue: WEsley Church, Beaumont Street, Hamilton.

April 28-29, Bromeliad Society of NSW Autumn Show. 9-11 Wellbank Street, Concord. Enquiries phone 9971-6183.

September 21-23, 2007 14th Australian Bromeliad Conference. Rydges resort Hotel, Port Macquarie. Enquiries to 47 Boden Street, Edge Hill QLD 4870 or lynnie@ledanet.com.au

June 2008, BSI World Conference in Cairns (Australia.) Enquiries to Lynn Hudson, 47 Boden Street, Edge Hill QLD 4870 or lynnie@ledanet.com.au

New Zealand

October 9-15, 2006. Bromeliad Society of New Zealand Spring display and plant sale. Venue: Milford Shopping Mall, Auckland. Contact Alan Cliffe (09) 479-1451.

United States of America

September 16-17, 2006. Bromeliad Society of Houston Fall Bromeliad Sale. Houston Arboretum & Nature Center, 4501 Woodway, Houston, TX USA. Sep 16, 9-5, Sep 17, 11-4. For more information, contact bromeliadsocietyhouston.com or 713-858-3047.

September 30, 2006. Florida Council of Bromeliad Societies' Extravaganza, Sale, banquet, and rare plant auction. Miccousukee Resort and Gaming Convention Center, Miami, FL USA. For more information, contact www.fcbs.org.

November 18-19, 2006. Caloosahatcheeb Bromeliad Society Annual Sale. Terry Park, 3410 Palm Beach Blvd., Fort Myers, FL. Contact : Larry Giroux, DrLarry@comcast.net

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.

Members-Only web site access: *Username*: Pseudaechmea, *Password*: ambigua