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Cover photographs. **Front:** *Tillandsia pruinosa* a delightful little Tillandsia with silvery foliage having the appearance of being coated by a heavy frost. Photograph by Marcel Lecoufle. **Back:** *Aechmea rubrolilacina* in bloom at Selby Gardens. See Text on page 40. Photograph by Verne Sawyer.

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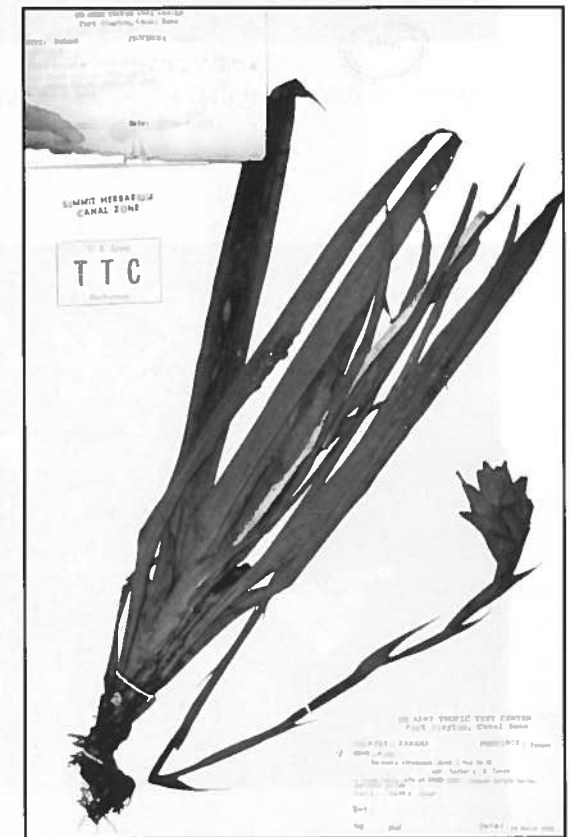
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The 'Bloody Whip', a striking new *Guzmania* from Panama.

Simon Pierce¹ and Jason R. Grant²

Summary. Here we report the rediscovery of *Guzmania virescens* (Hooker) Mez var. *laxior* L.B. Smith from the type locality, and in presenting the first photographs of this plant in the wild, confirm its distinctiveness from both *G. virescens* and *G. loraxiana* J.R. Grant. Differences were so great that this taxon is hereby elevated to species rank with the binomial *Guzmania flagellata* S. Pierce & J.R. Grant, sp. nov. to emphasize its whip-like red scape.

Guzmania flagellata (syn. *G. virescens* var. *laxior*; Figure 1) is an enigmatic plant previously known only from the type collection. It was discovered by Edwin Tyson on the 8th of February 1966 in cloud forest at 810 m on the eastern slopes of Cerro Jefe (Figure 2; see also Pierce & Aranda, 2000), Panama Province, Republic of Panama, and subsequently described by Lyman B. Smith (Smith, 1971). During a recent trip to Cerro Jefe, a lone flowering individual was seen growing terrestrially in deep shade in the understory of taller forest covering the slopes of the hill. Ten vegetative individuals were counted, also growing terrestrially in the shade and amongst deep leaf litter. Leaves of all plants were a deep purple color on the underside and partially so on the upper surface, lending the plant a dark overall appearance (Figure 3) - probably an adaptation to the shaded habitat (see Benzing, 1980).



S. Pierce

Figure 1. *Guzmania flagellata* holotype specimen with fire-damaged original label.

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S. Pierce

Figure 2. Cloud forest at Cerro Jefe, Panama.



S. Pierce

Figure 3. *Guzmania flagellata*: Rosette growing amongst leaf litter.



S. Pierce

Figure 4. *Guzmania flagellata*:
The 'Bloody Whip', habit.



S. Pierce

Figure 5. *Guzmania flagellata*: Inflorescence.

The habit of the plant was striking - a bright red inflorescence atop a gangly, whip-like red scape nearly a meter in length, but only 5 mm in diameter (Figure 4). This rose triffid-like from the dark rosette, giving the plant the macabre appearance of having been dipped in blood. All bracts were scarlet and the corolla was lemon yellow (Figure 5), typical of hummingbird-pollinated guzmanias (see Pierce & Gottsberger, 2001). Indeed, it was this colorful inflorescence, apparently hanging in mid air, which first caught the collector's attention.

Type specimens are somewhat inconsistent; that held at the Missouri Botanical Garden and pictured in Smith & Downs (1977) has three spikes borne on the single scape (Figure 6), whereas that held at the Smithsonian Tropical Research Institute (and the specimen we examined) has only a single spike (Figure 1). However, individual spikes, and all other characteristics, appear to be identical between specimens. Bromeliad inflorescence systems are clearly modular, consistent with the synflorescence concept of reproductive architecture in plants (Schroeder, 1987). In a synflorescence the uppermost spike is the true inflorescence or 'main florescence', and subsidiary spikes (co-florescences) are repeated units of identical construction, numbers of which may vary ('paracladia'; see Vegetti & Anton, 1996). In grass shoots the size of the main growth point (apical meristem) immediately prior to flowering determines the number of initial cells available for co-florescence production, and this depends mainly on the age of the shoot at flowering (Ryle, 1963). Similarly, in seven plants of *Aechmea dactylina* Baker examined at Cerro Jefe, the number of co-florescences ranged from 22 to 57 (S. Pierce, unpublished data), with smaller plants producing fewer co-florescences. Thus, although characteristics such as bract size and shape may vary little between individuals (helping delimit the species), the overall size of the inflorescence system is quite variable. Differences in co-florescence number observed between specimens of *G. flagellata* probably reflect the history of each individual plant.

Suffering the lack of available material of *G. flagellata* in preparing the description of *G. loraxiana*, Grant (2001) was concerned that these two taxa could eventually prove to be one and the same. However, in life *G. flagellata* differs from *G. loraxiana* in coloration, with bracts and the scape of *G. flagellata* being predominantly red rather than green, and with yellow floral parts rather than white. Also, the upper-five scape bracts of *G. flagellata* are brightly colored and relatively massive (Figs. 3 & 4), greatly exceeding the length of scape internodes - a characteristic not shared by *G. loraxiana*.

Guzmania flagellata supposedly differs from *G. virescens* mainly in the length of scape bracts (Smith, 1971; Smith & Downs, 1977). However, this determination was made from a dried specimen half a decade after Tyson collected it, and it is likely that Lyman Smith did not have the advantage of seeing the distinct scarlet coloration of *G. flagellata* (certainly this herbarium specimen does not retain its color today). It is also evident from living material

that the bright yellow corolla is distinct (in *G. flagellata* 'petals [are a] very pale-whitish, or pale-yellow-green color'; Hooker, 1857), and the extreme length of the scape is a much more striking feature in life than when folded onto a herbarium sheet. Other distinguishing features include the rounded or deeply notched (obcordate) floral bract tips of *G. flagellata* (vs. acuminate bract tips in *G. virescens*), and the distinctly enlarged upper-five scape bracts. *Guzmania virescens* is 'a native probably of Venezuela' (Hooker, 1857), although it has subsequently been found once in Ecuador (specimen at Missouri Botanical Garden, MO 01081421). Alternatively, *G. flagellata* has only been found in Panama, at Cerro Jefe. Other local endemics include *Guzmania armeniaca* H. Luther, (Luther, 1993), *Werauhia jenii* S. Pierce (Pierce, 2001) and possibly three as yet un-described species of *Werauhia* (S. Pierce, unpublished data). A number of species endemic to Panama are also present; *Aechmea allenii* L.B. Smith, *Catopsis micrantha* L.B. Smith, *Guzmania circinnata* Rauh, *Guzmania filiorum* L.B. Smith, *Guzmania macropoda* L.B. Smith, *Werauhia lutheri* S. Pierce & J.E. Aranda (Pierce & Aranda, 2000), *Werauhia millennia* J.R. Grant (Grant, 2000), and *Werauhia panamaensis* Rauh.

Thus, a number of key characteristics differ drastically between *Guzmania virescens* and *G. flagellata* - so much so that the latter merits recognition at species rank. Here the specific name reflects the exceedingly long, thin scape, from the Latin 'flagellum' (whip).

***Guzmania flagellata* S. Pierce & J.R. Grant, nom. nov.** Figures 1-6. = *Guzmania virescens* var. *laxior* L.B. Sm., Phytologia 22: 85, figs 3-4. 1971.

TYPE. Panama. PANAMA: Cerro Jefe, in tree top, cloud forest, 810 m, 8 February 1966, Tyson 3444 (holotype SCZ, sheet # 00984; isotype MO, sheet # 3270951).

A *Guzmania donnell-smithii* Mez ex Donnell Smith cui affinis, sed scapis longioribus (93 cm) superare foliis, bracteis florigeris obcordatis (vs. acuminatis) differt. A *Guzmania loraxiana* J.R. Grant cui proxima, sed bracteis florigeris rursis (vs. viridis) longioribus (35 vs. 7 mm) et petalis flavis vs. albis differt.

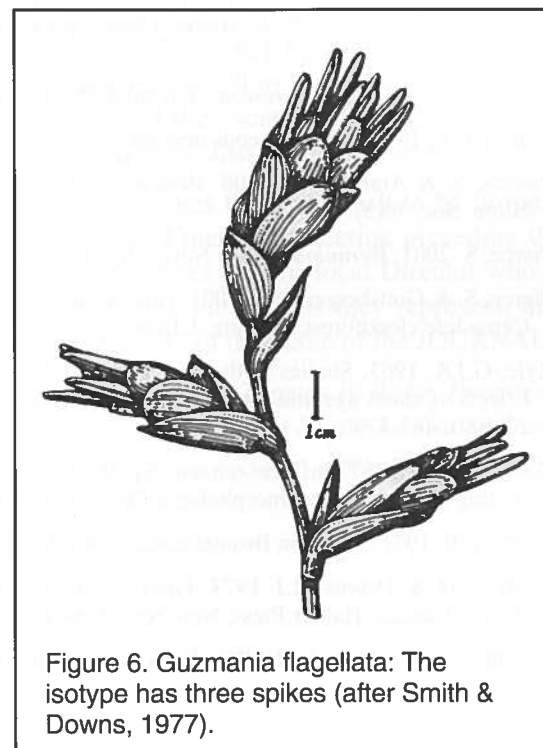


Figure 6. *Guzmania flagellata*: The isotype has three spikes (after Smith & Downs, 1977).

S. Pierce

SPECIMENS EXAMINED. Panama. PANAMA: northern slopes of Cerro Jefe, 800 m, plant acaulescent, terrestrial, growing in shaded understory, 8 March 2001, *Pierce 01-0044* (PMA).

Rosette spreading. **Leaf sheaths** 9.5×6 cm, with cyanic stripes on both surfaces. **Leaf blades** 35.6×3.4 cm, margins entire, both surfaces maroon but becoming green towards tip on adaxial surface, tip acuminate. **Scape** erect, 93×0.5 cm. **Scape bracts** ligulate and foliaceous proximally, becoming much reduced (6.9 cm long) and imbricate distally, red-maroon, apiculate, the upper-five scape bracts much enlarged; exceeding internodes, sub-erect, acute, bright scarlet. **Inflorescence** strobilate, $6 \text{ cm} \times 1.3 \text{ cm}$. **Floral bracts** scarlet, 3.5×2.3 cm, the tips obcordate proximally, becoming rounded and yellow-tipped distally. **Sepals** exceeding floral bracts, lemon yellow. **Petals** lemon yellow.

ACKNOWLEDGEMENT:

We thank Richard Gottsberger and Jorge Aranda for their assistance.

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Notice of Annual Meetings, Call for Budget and Other Business Items

You are hereby notified that the **annual general meeting** of the Bromeliad Society International will be held at the St. Petersburg Hilton Hotel, 333 1st Street, St. Petersburg, Florida at 9 a.m. on May 14, 2002 to consider such business as may be brought to the attention of the BSI Board of Directors. All business matters must be sent in writing to the president at least 60 days before the meeting (Bylaws, Art. VII, part 2). The **annual meeting of the Board of Directors** will be held immediately after the general meeting. The following schedule applies:

- 1) 90 days before the meeting: Officers, directors, and committee chairmen shall send budget requirements and financial accounting to the treasurer. (Standing Rules 3 and 6).
- 2) 30 days before the meetings: Officers, other directors, and committee chairmen shall submit annual reports to the president and send copies to each officer and director. (Standing Rules 3 and 6). Annual reports are due by April 14, 2002. Agenda items that would require a vote by the board of directors should be submitted to the president by March 14, 2002 for inclusion in the agenda.
- 3) 30 days before the meetings: the president will mail the agenda to each officer and director. (Standing Rule 3, par. 2g).

Chairmen of the standing committees are elected by the Board of Directors. Nominations may be made by any member of the society in writing at least 30 days before the annual meeting. Nominations may also be made from the floor.

Any BSI member who has an issue or issues that they wish to be brought before the board, may either attend the general members meeting preceding the Board of Directors meeting or convey those issues to their local Director who is a member of the board. A list of all Directors, the regions they represent, and their current addresses can be located on page 47 of this issue of the JOURNAL.

Thomas W. Wolfe, President,
5211 Lake Le Claire Road,
Lutz, Florida, 33549

Florida West Coast: A Trailblazing BSI Affiliate

H. Alton Lee

When the registrants for the 15th World Bromeliad Conference gather at the St. Petersburg (Florida) Hilton Hotel, few of them will be aware that they are being hosted by one of the oldest bromeliad groups in the known universe.

The first bromeliad society affiliate formed in Southern California in 1952 as an outgrowth of the just organized international bromeliad society. Two years later, Florida West Coast was born. According to early journals, another society was also evolving in the New Orleans area at approximately the same time, but FWC had no less than Mulford Foster himself orchestrating it forward.

Information provided by all of the living charter members at the time of the author's series of interviews indicates Foster was invited to come and speak to a local garden club. Presumably, he shared some of the same prejudices many hold about garden club groups and initially resisted agreeing to visit. When Foster did finally acquiesce, he got a big surprise.

"He realized we were not a tea and cookie gang exchanging gossip and recipes," Mrs. Kenneth (Mildred) Palmer recalled. "There was a lot of interest both by local orchid society members and our garden club women. When Mr. Foster saw we knew a thing or two about plants and were really, REALLY interested in learning about bromeliads, he changed his tune."

More than that! Foster pushed a group of the more enthusiastic women to form a local society and worked heavily with the group as it steadily evolved. There are many notes about this evolution to be found in BSI journals (then called bulletins) published in the 50s.

"It was really (the late) Dorothy Evans and Irma Dietrich who got us going," Mrs. Harrison (Frances) Fox, another charter member, remembered. They got to know the Fosters well, went to their place in Orlando often and organized things for all of us."

Other charter members of the group included Mary Gilchrist, a garden columnist for "The St. Petersburg Times" and Fern Lawrence, who had secretarial skills and kept detailed minutes, some of which were shared in early bulletins. Ida Kaufhold, who was another charter member, usually sent in material. In a 1954 issue, she expresses her excitement very vividly. "We bromeliad enthusiasts had a thrill second to none last week," she wrote, "when Mulford Foster came over from Orlando to our Orchid show... to display some of his choicest plants. We soaked up information like so many sponges and just fell in love with the blessed fellow." Three other original members about whom little was remembered by survivors included, Edith Oakley, Ethel Appleton, and Ethel James.

Although almost all of the early records have been lost or destroyed over the years, charter members confirmed some other important early details about the growing group. Ruby Kline and Mrs. Frank (Margaret) Walmsley were also early members and had a major influence on recruiting a teenager named Harry Luther to the group. Years later, he held many offices in the Florida West Coast Society-including presidency in the 70s- before moving on to greater glory as Bromeliad Identification Center Director at Selby Gardens.

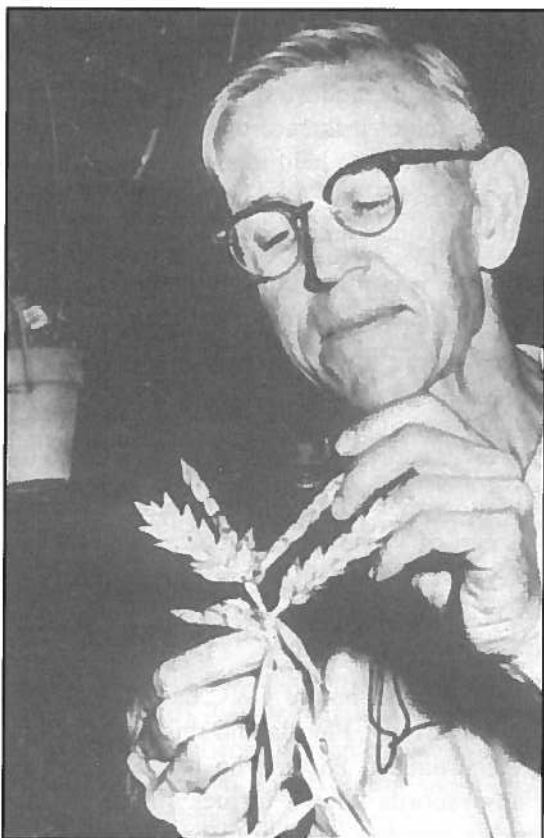
Margaret Walmsley was a serious, published horticulturist and had a legendary local garden filled with bromeliads. Although the author only saw the garden when it was past its prime (Mrs. Walmsley was then in her late 80s), it was filled with many, rare and exotic plantings -plants that are still not common even now. Harry remembers that Ruby Kline was first interested in orchids but caught the bromeliad fever badly. He recalls that she seemed to garden "24/7".

Incredibly, little more than a year after forming, FWC staged its first small bromeliad display as part of a local orchid show, which was duly reported in the *Journal*. Such displays were then quite a rare occurrence. Ruby Kline helped organize this first effort with lots of support from the new group, which was still meeting in members' homes at the time.

It would be 10 years later before FWC had its own individual bromeliad show at the Bank of Clearwater, Florida and this proved to be a major event in bromeliad history. According to Foster who wrote the bank officials after the event, "So far as any records known to me... there has never been a major horticultural exhibition devoted entirely to bromeliads (anywhere). That you made it possible for the bromeliad enthusiasts on Florida's west coast to enjoy this distinction makes the show indeed a memorable occasion."

It was indeed a very big deal, reported prominently in all the local media and literally drawing a group of international visitors among them W.W. G. Moir from Hawaii, Luis Ariza-Julia, botanist from the Dominican Republic and Stanley Smith, a well known horticulturist from Nassau. Reports the author could not confirm also indicate some prominent bromeliad growers came from as far away as Germany. Virtually everyone else whose name has surfaced in early journals over the years as a bromeliad star was in attendance including but not limited to Julian Nally (who reported on the event for the *Bulletin*), Ed Ensign, Jean Merkel, and Ralph Davis. A number of new members to Florida West Coast, who would also become bromeliad stars included: Morris and Helen Dexter, future hybridist, Ervin Wurthman, Charles Coolbaugh (another future hybridist). Horticultural teacher, John Beckner, now a staff member at Selby, and the aforementioned Harry Luther. Other early FWC members: E.H. Palmer, who wrote a number of articles in early journals, Mrs. Lillian Washburn, Mrs. Marian Snowden (who soon opened a popular local nursery heavily into bromeliads), and Harold and Frances Anderson. For many years, FWC held its meetings at the Anderson home and enjoyed its spacious garden for numerous events. The Andersons eventually started an annual garden walk, which attracted thousands,

Figure 7.
Mulford Foster
during his
hybridizing days



Racine Foster



H. Alton Lee

Figure 8. Mrs. Harrison (Frances) Fox and Mrs. Kenneth (Mildred) Palmer, two charter members of FWC, were honored at the society's 30th anniversary in 1984.

many of whom could not resist the wide variety of bromeliads. The evolving Florida Botanical Garden of today grew out of this event spearheaded by the Andersons, Mrs., Mildred Palmer and many volunteers from FWC.

The 1964 show was chaired and coordinated by Mrs. Anna (Jinks) Watkins, also a local horticultural instructor and, easily, one of FWC's most important members over its entire history. Her enthusiasm and tireless recruiting for the group made her sort of the poster woman for Florida West Coast and generations of members have passed through the nearly 50 year old society as a result of Jinks' buttonholing them and selling them on the wonders of bromeliads. Many of those working on the current 2002 convention can trace some of their interest in bromeliads back to Jinks.

The Vice Chairman of the Clearwater show was Wesley W. Shilling an important plant figure at the local Earl J. Smalls Growers, a company still in business to this day, but not as focused on bromeliads as it was then. Incidentally, BIC director Luther worked here, too, years before his present position. Smalls had a major exhibit at the 1964 show as did Jack Holmes' Nursery, then one of the biggest nurseries in the Tampa Bay area and extensively devoted to bromeliads. Holmes was among the first to sell the newly discovered *Aechmea chantinii* for \$4 each according to a 50's catalog. These were brought back to them by a very young Lee Moore, who though never a member of Florida West Coast, has long had ties with the group.

In 1959, the second Florida bromeliad group had formed in Miami and many of their members came to the Clearwater show, which ultimately amounted to a sort of preview of present day conventions. Fantastic Gardens Nursery, also from Miami, came to put in a big display. Older readers may recall that this long-gone nursery was once widely regarded as one of the best places to see and buy tropical plants in the entire country. This was the nursery of Bob and Catherine Wilson, who also compiled a now much sought after bromeliad book in the 60s. Later, they resettled in Costa Rica. Those possessing older journals can find ads for Fantastic Gardens as well as those of many other wonderful growers, who are now only happy bromeliad memories.

Ervin Wurthman left FWC to form the Tampa Bay Guild group across the way and recruited such early members as Lennie Yarbrough, Beryl Allen (for whom a *Billbergia* is named and who was chairwoman of the early bromeliad robin, a letters exchange), Carl Perryn, Pat Patterson, Tom and Leila Davis, Herb Hill, Sr. and Jr. and today's BSI president, Tom Wolfe. Many of these people as well as many Florida West Coast members have published material in the journal over the decades.

Henry J. Rahmlow joined both societies in the late 60s, and it was he-not without a great struggle-who pushed both groups to have a newsletter. Many resisted, unwisely thinking it an unnecessary expense, but Henry prevailed. The author detailed Henry's career in an earlier *Journal* (Nov.-Dec.1980). When then



Paula C. Lee

Figure 9. Some past presidents of the Florida West Coast Bromeliad Society gathered for the society's 30th anniversary. Left to right: Joyce Logue (standing in for husband Pat), The author, Rick Paul, Anna (Jinks) Watkins, Dr. Morris Dexter and Marjorie Spiegel.



Courtesy FWCBS

Figure 10. A low quality but rare photo showing Luis Ariza-Julia from the Dominican Republic, W.W. G. Moir from Hawaii, and Stanley Smith from Nassau who were among the many international visitors to the first total bromeliad show ever held. The 1964 event took place in Clearwater, Florida and was sponsored by the FWC.

editor of the journal, Victoria Padilla visited FWC in the 70s, she praised the newsletter as vital and essential. She and the author found they both shared the view that groups without a publication to keep members rallied and informed tend not to last for very long. It was finally agreed by most that a regular publication is an absolute essential.

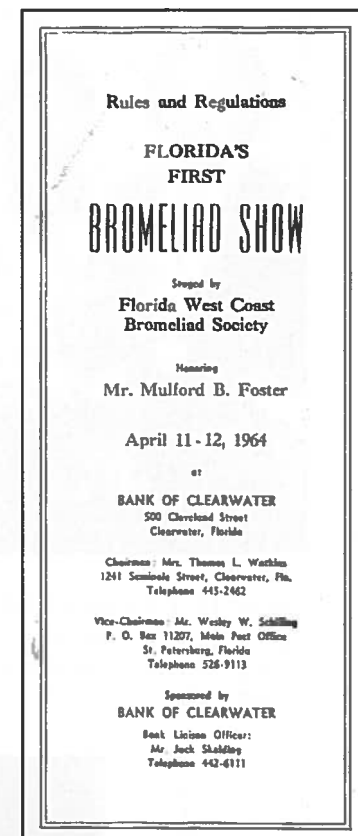
After the 64 show, Florida West Coast had really started to grow as well as the New Orleans, Miami and Southern California societies. Membership statistics were regularly reported in the journal in the early years. Yet even though the FWC bromeliad show was regarded as a smash success by all, it would be nearly 20 years before there would be another show from the group.

When the author joined FWC in the middle 70s, the society was attracting huge crowds and meeting in two locations, the Anderson's home in St. Petersburg, which it had outgrown, and the large home of Pat and Joyce Logue in Clearwater. Dr. Logue was then the president.

Sadly, FWC had begun to have a local reputation of not being very warm and welcoming to newcomers and also of skewing too much to the professional person and not the average Joe gardener-collector. When the author suddenly found himself president of the group following Logue, he decided to institute some changes, not all of which were readily accepted.

First, the society had to move to a larger central place as no member's home could really accommodate meetings. A bank was eventually chosen. Since that time, the society has always met at neutral locations, banks and churches in particular.

Second, in an effort to address the warmth factor of the group, the author persuaded a member, Mrs. Grace Ramsperger, to begin serving refreshments and create a social time as well as a plant-meeting time. The idea was blatantly copied from the local Tampa Guild where it had been started by Ann and Andy Price, members of both societies. It has proved a huge success; and despite the initial criticism that people would just come to eat and socialize, the social time



Courtesy FWCBS

Figure 11. A copy of the program for the 1964 bromeliad show, the first horticultural show ever held anywhere devoted entirely to bromeliads.



H. Alton Lee

Figure 12. Officers of FWC in 1984. Left to right: Eloina Rivera, Floyd Wise, Rick Paul and Helga Tarver. Helga is still an active member in charge of setting up seminars at this year's 15th World Bromeliad Conference.



H. Alton Lee

Figure 13. Mrs. Anna (Jinks) Watkins, the glue who held FWC together through many lean years, and Dr. Morris Dexter, both past presidents of FWC, hold the 30th anniversary celebratory cake.

has become an integral part (and pleasure) of a meeting. Many societies have now followed the concept.

Additionally, the author began a plant raffle-that continues to this day-- and got the society to buy seedlings from local growers with members being encouraged to bring back their successes (or even failures) for further discussion. Tom Davis, Herb Hill, Jr., Grant Groves, Bud Martin, Dennis Cathcart, and Michael Kiehl have all contributed generously over the years and the raffle helped the Society's sometimes unsteady finances considerably.

FWC had rarely done much apart from its meetings, so garden tours were started and have been in and out of favor over the years. The group was pushed to become project-oriented. Joining and supporting Selby Gardens, only recently formed at the time, was an early project. This was years before there was a Florida Council or a Bromeliad Identification Center or a Weevil Fund on which to focus.

Finally, after decades of only selling plants at local garden walks and the county fair, FWC had a successful mall sale in the early 80s, and the next president, Ellen Peyton, at last persuaded the group to try a small show again. Although in subsequent years, FWC has not really done that many shows, sales have become a much more regular, dependable and income-producing event.



H. Alton Lee

Figure 14. Bromeliad stalwarts of FWC. (L to R): Drs. Morris and Helen Dexter, and Ervin and Velva Wurthman.

Over the years, though FWC has had serious ups and downs as such groups inevitably do, it has always come back and started to grow again, even after a couple of incidents where it did seem the society was finished. Recruiting new and enthusiastic people who will stay in a group is never easy. As current



T. U. Lineham

Figure 15. Harry Luther, Director of the Mulford B. Foster Bromeliad Identification Center, began his interests in bromeliads as a teenager and as a member and later president of the FWC.

charter members, many approaching their 90s at the time, were still enthusiastic about bromeliads and still growing some plants-in some cases, progeny of original material they had acquired when they first joined the group decades before.

So in the early 50s when Mulford Foster, finally agreed to come and do a garden talk in sleepy St. Petersburg, he couldn't have possibly foreseen what incredible and far-reaching impact his visit would have. Now, all these years later, the society hosts the convention and naturally hopes it will attract new and enthusiastic -even younger-members, who fired up with bromeliad fever, will keep FWC pupping into the future.

Gulfport, Florida

President, Fay O'Rourke has observed "People appear and join and seem really enthusiastic members for a year and then are suddenly gone and never seen again". It was ever thus. The hardcore bromeliad addicts keep a group going even though new, if not necessarily young, blood is always needed and welcomed.

But in nearly 50 years, Florida West Coast has had an amazing history. Of course over that many decades, there have had to be a lot of programs whomped up and virtually anyone who has ever been anyone in bromeliad circles has turned up at some point to do a program. And at every convention, FWC has always been well represented. In 1977 in New Orleans, FWC had one of the largest turnouts of any society at the time. And in 1984 when the society celebrated its 30th anniversary all of the living charter members were there in attendance plus many other old timers. Every one of the older/



Paula C. Lee

Figure 16. The author and Marian Snowden, long-time member of FWC, was once owner of a popular nursery in Tarpon Springs, which attracted many bromeliad lovers and was the site of society meetings.

WBC 2002 - A Bromeliad Beach Party

Hattie Lou Smith

Plans for the Fifteenth World Bromeliad Conference, "Bromeliad Beach Party", in St. Petersburg, Florida are well underway. For several years there has been strong demand, especially from members outside the US, to schedule the Conference before the month of June, when airfares tend to increase. The Conference Committee was fortunate enough to be able to schedule pre-conference activities for May 13, through the final post-conference tour to Selby Gardens on May 20th. Typically, the beautiful city of St. Petersburg with its lovely beaches, gardens, marinas, and museums is at its best in the month of May.

The host hotel will be the Hilton St. Pete located in downtown St. Petersburg. Many interesting areas of the city are within walking distance of the hotel and a trolley circulates throughout the area from the hotel, including to the beaches. Rates for the hotel will be \$99 with a tax of approximately \$10. Parking at the hotel for conference registrants will be \$4 per day. For reservations call 1-888-843-6929 from 8AM-5PM (EDT) on weekdays, or the toll-free number 1-800-944-5500 may be used. The first number has the advantage of going directly through to the sales office and may eliminate any confusion in making reservations. To receive the special rate, please state that your reservation is for the WBC 2002.

The Conference activities begin with an Optional Tour on Monday, May 13, to the famous Florida Aquarium. They continue on Tuesday, May 14 with a trip to the home gardens of Rob Branch and a first hand look at Marie Selby Botanical Gardens in Sarasota. Selby Gardens is world famous and houses the Bromeliad Identification Center, directed by Harry Luther. Luncheon will be served under the huge banyan trees of Selby.

The very successful Scientific Seminars, coordinated by Harry Luther, will be held Wednesday, May 15 and feature an international lineup of some of the top scientists involved in bromeliad research. Those participating will be David Benzing, John and Kathleen Utley, Renate Ehlers, Walter Till, Sue Sill and Elton Leme.

Support in the form of donations is needed to continue presenting world famous scientists at these Seminars. Donations for this activity and to support the Judged Bromeliad Show Awards can be made to the WBC2002 Treasurer, Don Garrison, in the name of either an individual or a society.

Plant entries for the judged WBC Show will be received on Wednesday. Thursday will be the day of Show judging as well as the day that a free buffet luncheon will be available for all registrants. The grand opening of the Sales Room will be Thursday evening.

On Friday, May 17, the bromeliad show will open and free home tours will be offered. Registrants must make a choice of the morning or afternoon home tour bus. The varied activities of Friday will end with the entertaining Rare Plant Auction, where proceeds go to benefit the Bromeliad Identification Center.

Conference seminars will be conducted all day Friday, Saturday and most of Sunday by thirteen knowledgeable speakers. Some of the topics include a glimpse of the hybrids and growing conditions of Australia, Tillandsia habitats of Central and South America, and a lively, innovative Artistic Forum.

Saturday ends with a blast, notably a Beach Party banquet of wonderful food, friends and activities that begins with a roast by the "retired" Mr. Billbergia, Don Beadle. Sunday is filled with events ending at 3 p.m. when packing up begins.

A different and exciting optional tour will be offered each day of the conference, ending with a repeat day trip to Selby Gardens on Monday, May 20, which will also include luncheon and a visit to Tropiflora, home of the Cargo Report. There is a charge for each optional tour. However, Chairman Inez Dolatowski has been able to significantly reduce this by making special arrangements. For tour information and reservations, contact: Inez Dolatowski PO Box 1615, Tallavast, Florida 34270 ldolatowski@tampabay.rr.com.

All WBC affiliates are urged to participate in the conference by putting in a display. These displays may vary widely, from a floor scene to a scrapbook placed on a table. Affiliates Display Chair, Roland Schnabel, 5106 E. 127th Av., Tampa, FL 33617 Rschnabe@gte.net will provide information.

Affiliates and registrants are eligible to sell bromeliads and other related items at the Members Sales in the Sales Area. Bar codes must be requested of Joyce Brehm, 5080 Dawne St., San Diego, Ca. 92117 joycesjoy@aol.com.

Commercial registrants will be invited to enter the commercial section of the Judged Bromeliad Show and to place a Commercial Display.

Join us for a vacation in the beautiful month of May in Old St. Petersburg, the jewel of Florida. Come to a Bromeliad Beach Party!

Fort Myers, Florida

A new Species of *Aechmea* from Suriname and Northeastern French Guiana.

Eric J. Gouda¹

Aechmea moonenii Gouda, sp. nov. Figures 17-19.

Type: French Guiana, Savane Roche de Virginie - Bassin de l'Approuague, 4°11' N, 52° 9' W, [LRM1][LRM2][LRM3] 120 m., 22 May 1998, *J. Moonen 210*, (Holotype U, Isotype CAY.)

Ab Aechmea rodriguesiana differt foliis multo longioribus. Inflorescentia subcylindrica rachide longa exposita ramis multis. Bracteeae florales 34-36 mm longae, cuspidatae, mucro sepalis plusminusve aequilongus. Ab Aechmea polyantha differt bracteis floralibus multo majoribus curpidatis flores pro maiore parte obtegentibus.

Plant acaulescent, 95-110 cm tall, flowering much taller, dense, with 18-25 leaves, forming a dense sub-tubular or utriculate rosette, green. **Leaves** very thick and rigid-coriaceous, 100-140 cm long, shorter than the inflorescence; **leaf-sheaths** large, contracted into the blades, stiff-coriaceous, elliptic, slightly inflated, 34-42 × 18-20 cm, laxly serrate toward the apex, with thin margins, subdensely lepidote, on both sides, with closely appressed, brown scales, castaneous; **leaf-blades** erect, rigid, fleshy and coriaceous, nearly flat, ligulate (ensiform), ca. 100 × (7.5-)9-12 cm, densely serrate at the base, with blackish slightly retrorse (toward the base) 2-6 mm long broad flat spines, often with blackish margins, sub-attenuate or rounded and cuspidate, sharply pungent with black cusp, minutely lepidote, on both sides, with immersed, transparent or pale-brown scales, rich green, tinged with red at the apex. **Inflorescence** 2-branched at the base, of 23-30 branches, subdense or dense, including the peduncle 100-150 cm long; **fertile part** 23-32 × 10-15(-20) cm, subcylindric. **Peduncle** wholly covered by bracts, erect, 75-110 cm long, 13-17 mm in diameter, sparsely lepidote, reddish-brown. **Peduncle-bracts** erect, densely imbricate, coriaceous to sub-chartaceous, ovate-lanceolate, entire, cuspidate and sharply pungent, more than three times as long as the internodes, sparsely lepidote, dried and brown at anthesis. **Axis** partly exposed, very stout, straight, terete, subdensely lepidote, reddish-brown. **Primary-bracts** flacid pendulous, stiffly chartaceous, lanceolate, entire, long attenuately acute and pungent, exceeding the branches, ferruginously subdensely lepidote, dry and brown at anthesis. **Sterile bases of the branches** indistinct or very short. **Spikes** spreading, polystichously and very densely, (4-)6-13 flowered, terete, ovoid to cylindric, irregular at the apex, 4-6(-9) cm long or more, 1.5-2.5 cm wide, fertile throughout. **Rachis** hidden. **Floral-bracts** suberect, very densely imbricate, stiff-coriaceous, prominently nerved toward the apex, irregularly carinate or with a thickened

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Joep Moonen

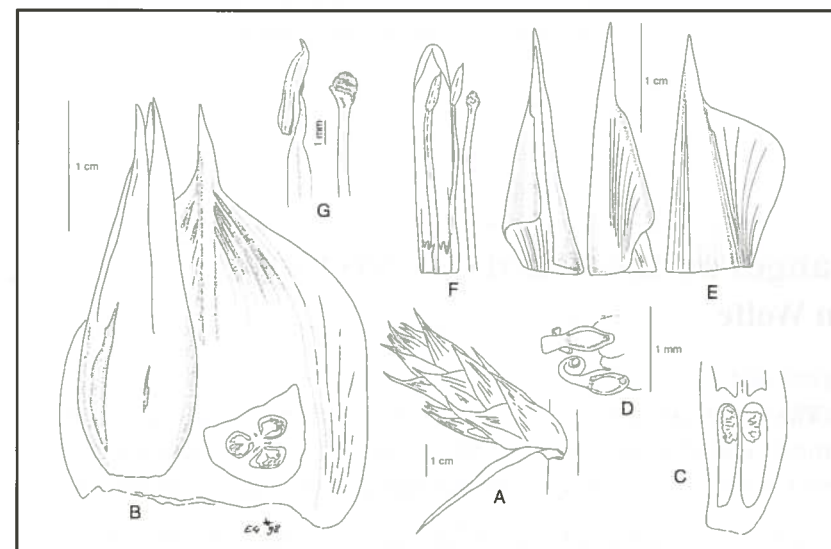
Figure 17. *Aechmea moonenii*



Joep Moonen

Figure 18. *Aechmea moonenii* showing closer detail.

midnerve at the base, ovate, cuspidate, pungent, nearly straight, 3.4–3.6 cm long (excluding a 7 mm long mucro), 2.4 cm wide, many times as long as the internodes, shorter than the sepals or just exceeding the sepals with its mucro, with thin margins, subdensely lepidote outside, red. **Flowers** contiguous, 3.6–3.9 cm long, sessile. **Receptacle** 2 mm thick. **Sepals** coriaceous and rigid, even, narrowly triangular (excluding the wing), strongly asymmetric, armed, attenuately acute and pungent with a 7 mm long mucro, nearly straight, 1.5 cm long (excluding mucro), 1 cm wide, with extended hyaline wing at one side, posterior ones bluntly carinate, free, subdensely lepidote, whitish or pale pink. **Petals** fleshy, tubular-erect and cucullate, lingulate, rounded, ca. $2.3 \times$ ca. 0.4 cm, free from each other, pale pinkish blue; **2 ligules** on petals (claw) present, fimbriate, attached well above the base, saccate, longitudinal ridges present. **Stamens** exceeding the pistil with half of the anthers, included; **filaments** fleshy and complanate, slightly unequal in length, 2 cm long, the inner whorl highly adnate to the petals only, white; **anthers** dorsifixed, nearly at the middle, linear, 4 mm long. **Pollen** grains globose. **Pistil** exceeded by the stamens (with half of the anthers); **ovary** inferior, obovate and strongly complanate, 11–17 mm long. Epigynous-tube short but distinct, less than 1.5 mm long. **Ovules** apical, caudate. Style sub-stout, longer than the ovary; **stigmas** linear, conduplicate-spiral. **Fruit** baccate.



Eric Gouda

Figure 19. *Aechmea moonenii*: A. spike; B. flower, floral-bract and cross-section of upper part of the ovary; C. ovary; D. ovules; E. sepals; F. petal with stamens and style; G. anther and stigma

Additional material studied: French Guiana, from type location, *J.Moonen* 165, 11-04-97 (U.); French Guiana, Crique Boulanger, *J.Moonen* 192 (U.); Suriname, on granite flat near Voltzberg *Gouda, E.J. & J.Moonen EG99-28*, 27-01-1999 (U, US, LBB);

Distribution: Epiphytic in primary forest and saxicolous on granitic outcrop ("Inselbergs" in northeastern French Guiana and the Voltzberg area in Suriname.

This new species differs from the related *Aechmea rodriguesiana* (L.B.Sm.) L.B.Sm. (including *Aechmea meeana* E.Pereira & Reitz, see Gouda 1999[LRM17]) by having much longer leaves, having a subcylindric inflorescence with a long (partly) exposed axis with many branches, floral bracts over 34 mm long, cuspidate, with the cusp about equaling the sepals. It differs from *Aechmea polyantha* E.Pereira & Reitz by having much larger and cuspidate floral-bracts, hiding most of the flower.

ACKNOWLEDGEMENTS:

The species is named after my good friend and bromeliad enthusiast Joep Moonen, who collected the type specimen and over the years has sent many specimens of Bromeliaceae from French Guiana to me for my research. I thank Dr. L.Y. Th Westra for preparing the Latin diagnosis.

LITERATURE CITED:

Gouda, E.J. 1999. Studies on the Flora of the Guianas No. 90: Checklist of Bromeliaceae of the Guianas with Notes on Critical Species. *Selbyana* 20(1): 30-39.

Utrecht, Netherlands

Changes on the Board of Directors

Tom Wolfe

The terms of service of directors Terrie Bert, Harvey Beltz and Rick Richtmyer ended at the close of 2001. I would like to thank Terrie, Harvey and Rick for the excellent job they did during their time on the board.

Four new members join the board and two other directors were elected to a second term. Serving as directors for 2002 through 2004 will be Joyce Brehm, Ed Doherty, Gary Gallick, Ken Marks, Fred Ross and Hiroyuki Takizawa. I would like to welcome all of you to the BSI Board and look forward to working with you as we attempt to accomplish great and wonderful things for the BSI membership.

Bromeliaceae on Inselbergs in the Guianas

Eric J. Gouda¹ and Joep Moonen²

My special interest in Inselbergs (rocky outcrops in the primary Amazonian forest) started with collections from a friend of mine, Joep Moonen, from a group of Inselbergs in northeastern French Guiana. These Inselbergs are dominated by mat vegetation composed of *Aechmea*, which is a new phenomenon for the Guianas. Mats of *Pitcairnia* (especially *P. nuda* and *P. sastrai*) were already known, but this phenomenon with large *Aechmea* species is new and possibly unique.

The collected aechmeas were new for the Guianas and most of them were also new to science. It is still not fully known how many of these are evolved species because it seems that hybridization has had a free hand in these populations.

Joep Moonen runs a small eco-tourism business called "Emerald Jungle Village", in Montsinery, French Guiana. He is a driven advocate for the protection of vulnerable wildlife areas, and is especially interested in bromeliads and aroids. He cultivates many species in the forest on his property, but especially those from French Guiana itself. Many bromeliads native to the area grow naturally on his property. He has created a small savanna of granitic rock in front of his house where he cultivates the Inselberg specimens.

First I want to focus on the research done on two Inselbergs: one in northeastern French Guiana and the other in central Surinam. At the end of the article I will give an overview of all bromeliad species divided over the different ecotypes (niches) on the Inselbergs.

Savane Roche (Rocky Savanna) "la Virginie"

Most Inselbergs can be visited only by helicopter, but the Inselbergs in the northeast of French Guiana can be reached by boat, followed by a tough walk. First we had to drive to Régina at the l'Approague River. Fortunately, Joep has good boats and is an experienced skipper. We traveled by boat only a short time upstream on the main river, and then traveled further on a tributary, the Mataroni River. Things have to be timed perfectly because of the tide. Sometimes we had to wait a while before we could travel on into the Savane Roche area, because there was not enough water on the rapids.

We stopped at a gold mining camp and I was amazed that the miners had a fully equipped kitchen, including a microwave, etc. in the middle of nowhere. We did not like what we saw but the coffee was good! On our way again, I learned that you have to know exactly what to do to pass through those rapids, I don't

¹ Curator of the Utrecht University Botanic Gardens

² "Emerald Jungle Village", in Montsinery, French Guiana



Joep Moonen

Figure 20. *Aechmea* vegetation (*Ae. polyantha*) on Savane Roche la Virginie. *Aechmea melinonii* is also found here and on the site in figure 21.



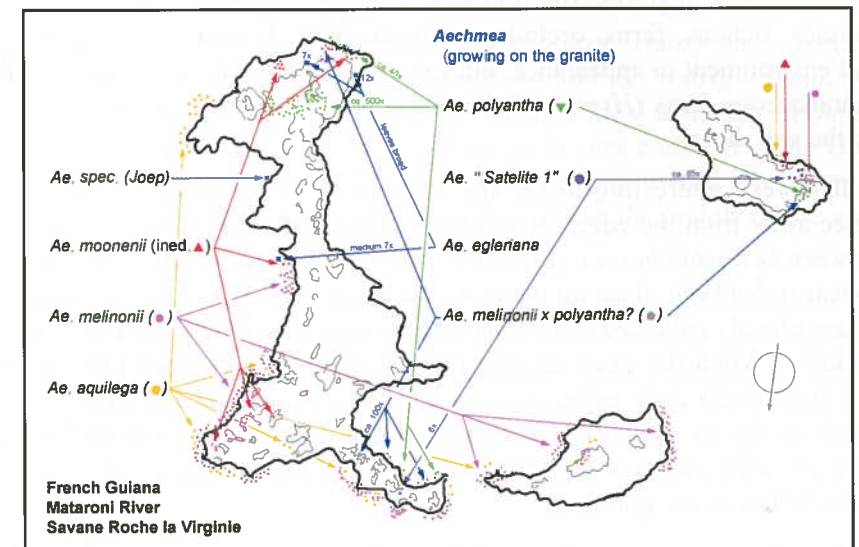
Joep Moonen

Figure 21. Another view of mats of *Aechmea* at Savane Roche la Virginie.



Eric Gouda

Figure 22. *Aechmea melinonii*



Eric Gouda

Figure 23. Distribution of aechmeas at Savane Roche la Virginie

think I could ever have done it by myself! The Mataroni River is really idyllic upstream. We traveled to a suitable place for making base camp, from where we could begin the walk of about 2 hours to the Inselberg called Savane Roche "la Virginie". We set up the base camp and made preparations for the night as Frank, an Amerindian from Surinam, prepared a meal for us. Next morning we left at 7 a.m. so as to allow as much time as possible on the Inselberg as we had to be back by 4 p.m. (otherwise it would become too dark to find the way back). This meant that we could stay only from 9 am to 2 pm each day to do our research. It is very impressive walking through the primary forest, although you don't see many of the plants there as they are concentrated mainly in the canopy. However, this changes when you enter the granitic rock area and start climbing the Inselberg. Suddenly you are able to look out over the primary forest, a view that left me breathless.

If you think that this savanna is a nice habitat for growing plants, you will think differently after you have been there. The bare rock, which is normally white, is covered with a layer of a kind of bacteria that makes the surface black. When the clouds clear the sun gets free play over the blackish granitic rock and suddenly it becomes over 50°C and you can't walk over the ground with bare feet. A moment later the sun can disappear and it can start raining cats and dogs, changing parts of the Inselberg into flowing rapids, and making the surface very slippery and dangerous for climbing the steep rock.

At the edges of the Inselberg is low xeric forest, with small trees (with very leathery leaves) to about 6 m tall. There is found *Clusiaceae* (*Clusia*) and *Melastomaceae* (*Topobea*) trees and the spectacular *Noranthea guianensis*, which normally grow as a liana, with its bright orange nectar containing bracts attractive to hummingbirds. You find all kind of cryptograms and epiphytes, such as mosses, lichens, ferns, orchids and bromeliads. It looks like a constantly humid environment in appearance, but can suddenly change into a desert. Small membranaceous ferns (*Hymenophyllaceae*) and mosses seem to dry out totally when the sun shines.

It is very interesting to see the succession of the mat vegetation some distance away from the edges. It starts with bromeliads (*Aechmea*) and growing in between is *Cyclanthaceae* (*Ludovica*) and later other herbaceous plants begin to appear in between, forming the mat. The small xeric trees start on these mats that have already collected some humus. The mats grow sideways while the trees grow taller. When the trees become too tall, they become vulnerable to wind which blows them over, especially when the tree is solitary and away from the edge of the forest. When the tree falls, the mat becomes loosened from the granite and slips into a vertical position causing all the plants to die and so the process starts all over again.

Over the last few years Joep and I have done an inventory of the bromeliads and Joep succeeded in making a quantification of the *Aechmea* vegetation on this Inselberg and its satellites (smaller granitic plates in the neighborhood). This can

be important when it comes to obtaining a protected status for the area, which will become necessary when more tourists begin to visit. This is certain to be the case, because the new (not yet opened) road will pass within a few kilometers of the Inselberg. Other inselbergs that are near roads have proven to be very vulnerable and can be destroyed by fire, leaving nothing of this unique typical bromeliad mat vegetation. This also demonstrates just how dry it can be.

Tillandsioideae

All seven Tillandsioideae species found grow epiphytically in the xeric forest, except for *Vriesea splendens* which prefers to grow on the floor in half shade. We did discover the rare *Tillandsia paraensis* (second collection/specimen in French Guiana). *T. flexuosa* is quite common on the small xeric trees along with *T. bulbosa*. We also found *T. adpressiflora*, *Guzmania lingulata* and *Vriesea* (*Mezobromelia*) *pleiosticha*. Probably all of these species are also to be found in the canopy of the surrounding forest.

Bromelioideae

First the non-dominant species: *Aechmea mertensii* is common in the Guianas and can be found here as an epiphyte only. *Disteganthus lateralis* and *Bromelia granvillei* are growing terrestrially at the edge of the denser forest. It seems that they stay smaller where there is more light. *Ananas* (probably only *A. ananassoides*) shares the same niche (habitat). The dominant mat-forming species are all large *Aechmea* species that can form groups of up to 500 specimens. There are still a few species that need further investigation to clarify their identity. There are at least two new species evolved. One of these, *Aechmea moonenii* (Gouda 2002), is a huge *Aechmea*, with stiff leaves ending in a sharp point, and often reddish near the apex. *Aechmea* spec. (fancy name Joep!) is a colorless *Aechmea* that resembles *Ae. moonenii* and *Ae. rodrigueziana*, with a digitate inflorescence. *Ae. melinonii* is perhaps the most abundant *Aechmea* on the granite and is very spectacular. *Ae. aquilega* is very common in the Guianas and is also found growing on the granite. It is not that dominant, but demonstrated that it was able to start growing right in the middle of the granitic surface.

Adding some other species to the picture, *Aechmea polyantha* was found here, which before had only been known from the type location near Manaus, Brazil (Gouda 1999). *Ae.* "satellite 1" is probably a hybrid between *Ae. polyantha* and *Ae. moonenii*. Then there are a few patches of an *Ae. egleriana* hybrid that varies in leaf width, but all have broader leaves than the true *Ae. egleriana* found in the neighborhood that had fallen from canopy trees rather than growing on the rocky outcrop. Another hybrid, *Ae. melinonii* x *Ae. polyantha* has been found in small groups.

In the past, there has been some misnaming of aechmeas from Manaus because of the famous paintings by Margaret Mee, which appear in the Baensch



Figure 24. *Aechmea polyantha*

Eric Gouda



Figure 25. The Voltzberg in Suriname

Eric Gouda



Figure 26.
An *Aechmea*
egleriana hybrid
starting mat
vegetation

Eric Gouda



Eric Gouda

Figure 27. *Aechmea x lanjouwii* (from the Voltzberg in Suriname)

book, "Blooming Bromeliads" (Baensch 1994), and in the Journal of the German Bromeliad Society (Gouda 2000). The *Ae. egleriana* painted by Mee was sought after by many people who would love to grow it. However, it was misnamed in the painting as *Aechmea polyantha*. The very narrow leaf of the type--probably a mixed collection of the two, may have confused her. She did paint the real *Ae. polyantha*, but put the name *Ae. meeana* on it; however this name is synonymous with *Aechmea rodrigueziana* (Gouda 1999), which she had also painted.

Interestingly, no *Pitcairnioideae* are found here, an exception to other Inselbergs in the Guianas.

One thing I had to clear up was a problem with an *Aechmea* found on the Voltzberg (an Inselberg) in Surinam. This *Aechmea* had been found by Professor Dr. Lanjouw (Univ. Utrecht) in 1933 and had never been found since. Lyman B. Smith described this species as *Gravisia lanjouwii* in 1956. The type did resemble *Aechmea polyantha* (described in 1974) very much and I couldn't decide whether the latter deserved to be a species on its own or had to be considered synonymous with the former. The thing that bothered me most was the description of the color of the flowers, which was not mentioned in the monograph (Smith & Downs 1979). The label said "flowers yellow"--instead of bluish--but I was not sure what Lanjouw meant by flowers (petals/sepals?).

The Voltzberg in Suriname

The Voltzberg is a spectacular dome-shaped granitic outcrop that can be reached by boat trips organized by Stinasu (an eco-tourism and wildlife foundation). At the base there is a large, flatter granitic plate from which you can take nice photographs of the two domes. We had planned to visit the so-called 'Top II', which had no pathway and must therefore be less disturbed. Because its walls were not particularly steep we expected to see more patches of mat vegetation. As we couldn't arrange a guide from Stinasu we decided to set out our own route from the plate to 'Top II' using a compass. 'Top I' has a pathway up to the top, but Top II' was not that easy to climb.

The bromeliads found here are *Ananas ananassoides* and *A. comosus*, both at the edges of the xeric low forest. This was also the case for *Bromelia karatas* (*plumierii*), of which we found only a few specimens. We found only two groups of *Aechmea lanjouwii* close together, one of about 15, and one of about 50 individual plants and couldn't find any others. It was growing on the granitic floor, but in the shade of small trees and covered by a weed (*Mimosaceae*) that is typical of secondary vegetation. Luckily they were in flower and we also found several plants in fruit. I was stunned to see the color of the inflorescence and the flowers, and, yes, the petals were yellow! So although the types did look very much the same (*Ae. lanjouwii* and *Ae. polyantha*), they certainly were not. The strange thing was that the fruits did not contain any seeds and you would expect to see more groups of the plants. This indicates that *Ae. lanjouwii* could be a hybrid (Gouda 1999), probably from *Ae. aquilega* x *Ae. moonenii* both of which

we found at the same location. *Aechmea aquilega* was mostly epiphytic, but also found on the granite here, and *Ae. moonenii* was high up in the canopy trees with one cluster low in a xeric tree at the base of the Voltzberg.

We had permission for restricted collecting, so we took a few young shoots for further investigation. These have grown out to full-sized plants now and flowered this summer at the Utrecht University Botanic Gardens. Some research on the flowers showed that there is no, or very little, pollen in the anthers, indicating that we are indeed dealing with a natural hybrid. This taxon would be: *Aechmea* x *lanjouwii* L.B. Sm. (pro sp.)

All formerly mentioned bromeliad species are not mat-forming nor dominant in the vegetation, although *Ae. aquilega* can form some larger groups. *Pitcairnia nuda*, in contrast, often forms large mats, mostly in combination with the orchid *Cyrtopodium* and several *Cactaceae*. It is even found growing on the nearly vertical slopes of the Voltzberg as *Melocactus neryi* does.

The Different Niches for Bromeliads on the Inselbergs

If we compare the bromeliad vegetation of the two Inselbergs, it is clear that they are totally different. The bromeliad species and their dispersion that we find on the Voltzberg are more typical for the Guianas. *Pitcairnia* plays an important role in the mat vegetation. This is not the case on Savane Roche "la Virginie", where *Pitcairnia* is totally absent and *Aechmea* plays the same role there.

Table 1 categorizes Bromeliaceae growing on Inselbergs in the Guianas into three main ecotypes (niches): 1) Bromeliads growing as epiphytes in the low xeric vegetation (mainly at the edge). This ecotype probably is not very different from those in the canopy of the primary forest around. 2) The saxicolous (on rock) growing bromeliads, under or in between the low xeric vegetation, have a more fluctuating environment than that on the primary forest floor, with respect to both light conditions (much stronger) and humidity (much more variable). Very few species can survive on the primary forest floor, because of the lack of light, but we did find *Disteganthus lateralis* and *D. basi-lateralis* there. 3) Bromeliads growing saxicolous on the granite, exposed to the extreme environment. The temperatures fluctuate more than in the canopy, where the constant evaporation from the trees keeps the temperatures relatively low compared to the black granitic surface of the Inselbergs. We can consider type 3 highly adaptive when compared to other saxicolous-growing bromeliads that are growing at higher altitude in the tropics with consequent lower temperatures. Most *Pitcairnia* species found on Inselbergs are endemic to this ecotype, but it is not yet clear whether that is the case for the new *Aechmea* species found.

The highest diversity is found in type 2, where canopy epiphytes and terrestrial growing species come together, but in both the number of specimens and in biomass, type 3 is much higher. The distinction between type 2 and type 3 is not always very sharp.

Table 1: Bromeliaceae growing on Inselbergs, categorized in three main ecotypes.

1) epiphytes growing in the low xeric vegetation (mainly at the edge)	2) terrestrial growing under or in between the low xeric vegetation	3) saxicolous, growing exposed on the granite
<ul style="list-style-type: none"> - <i>Guzmania lingulata</i> - <i>Tillandsia paraensis</i> - <i>Aechmea mertensii</i> - <i>Araeococcus micranthus</i> - <i>Racinaea spiculosa</i> - <i>Tillandsia bulbosa</i> - <i>Araeococcus goeldianus</i> - <i>Catopsis berteroniana</i> - <i>Tillandsia anceps</i> - <i>Tillandsia fasciculata</i> - <i>Tillandsia monadelpha</i> - <i>Werauhia gladioliflora</i> - <i>Vriesea (Mezobromelia) pleiosticha</i> 	<ul style="list-style-type: none"> - <i>Aechmea bromeliifolia</i> - <i>Aechmea campanulata</i> - <i>Aechmea lanjouwii</i> - <i>Aechmea setigera</i> - <i>Aechmea tocanina</i> - <i>Ananas annasoides</i> - <i>Ananas comosus</i> - <i>Araeococcus flagellifolius</i> - <i>Araeococcus goeldianus</i> - <i>Bromelia karatasi</i> - <i>Bromelia granvillei</i> - <i>Disteganthus basi-lateralis</i> - <i>Disteganthus lateralis</i> - <i>Streptocalyx poepigii (Aechmea beeriana)</i> - <i>Vriesea splendens</i> 	<ul style="list-style-type: none"> - <i>Aechmea aquilega</i> - <i>Aechmea egleriana</i> - <i>Aechmea melinonii</i> - <i>Aechmea moonenii</i> - <i>Aechmea polyantha</i> - <i>Pitcairnia geyskesii</i> - <i>Pitcairnia nuda</i> - <i>Pitcairnia saastrei</i>

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Utrecht, Netherlands

Bromeliad Society of San Francisco Web Page

The San Francisco affiliate now has its own Web page.
You will find it at: <http://www.geocities.com/sfbromeliad/index.html>

A Closer Look at Myakka River State Park

Teresa Cooper

For over a year now, I have been making monthly trips to Myakka River State Park to do population research. Over this time, I have developed a familiarity with the park and its inhabitants. So, as one may expect, I was delighted to see Chet Blackburn's article WBC Side Trips: Myakka State Park in the December issue of the Journal of the *Bromeliad Society*. As I read his article, I recognized the habitats he mentioned, as well as the animals and plants and activities. Myakka is a large, well used, and much appreciated park and offers a variety of benefits for society. Foremost, natural habitat is preserved. Outdoor recreation is available ranging from mild to physically challenging. Sunrises and sunsets are often accompanied by spectacular cloud shows, made more fantastic when viewed over the lake or prairie. And there is a seemingly never-ending composition of living organisms available for study.

Myakka River State Park is just as active academically as it is recreationally. Park Biologists Paula Benshoff and Belinda Perry support education and research efforts in the park. Persons involved in such efforts come from a wide range of backgrounds and interests. There is a large volunteer network as well as interaction with local grade schools, high schools and several colleges. Selby Botanical Gardens, another worthwhile side trip, is fifteen minutes west of Myakka and is home to one of the world's greatest collections of epiphytes. Selby Gardens interacts frequently with Myakka River State Park in the pursuit of research and teaching. Donna Krabill, the Educational Specialist at Selby Gardens, has been using Myakka to teach biological field science to schoolchildren. In fact, the children are studying the same organisms I am studying. Donna and I have been working together to incorporate the children's work into my own research. Not only do the children learn a lot, they are thrilled with the time they spend in the woods and excited because their work will be used practically and for a good cause.

That good cause is to help save bromeliad populations in south Florida that are being decimated by an exotic weevil, *Metamasius callizona*. In Myakka, two bromeliad species are affected; these are *Tillandsia utriculata* and *T. fasciculata*. The weevil is originally from Mexico and entered Florida on bromeliad shipments. Dr. Howard Frank (Entomology and Nematology Department, University of Florida) has been tracking the weevil since its appearance in south Florida over a decade ago and has been persistently working towards a classical biological control solution. This solution requires the introduction of a biological control agent to regulate the weevil population. Dr. Barbra Larson, who works with Dr. Frank, is presently studying a potential candidate, a fly that is a parasitoid of the weevil larvae.

In September 2000, Dr. Frank visited Myakka River state Park and found a weevil specimen in a dead *Tillandsia* plant that lay at the foot of the new observation tower. In January 2001, I began mapping and monitoring research on the weevil and its host plants in Myakka Park. My goals are to determine the rate of mortality the host plants are suffering because of the weevil, and which host plants are most susceptible and why. As well, I wish to understand how the weevil disperses geographically and seasonally. Such information will help determine where and when a biological control agent would be most effectively released, as well as provide an area with a monitoring history for release of the biological control agent.

Method development occupied my first six months in the field. Since then, I've been accumulating data and building a baseline description. At present, the host plant populations along the Myakka River have been mapped, as well as a few populations deep in the prairie, growing in oak hammocks supported by sloughs. Individual host plants are numbered and are monitored for signs of stress over time. When they die, I determine cause of death. Often the cause of death is unknown; but may be rot from flood, drying out from lack of rain, overheating in the summer, freezing in the winter, being torn from a perch by wind or rain; and of course, weevil infestation.

I search for weevil evidence not only in the host plants selected for monitoring, but also in any dead host plants that fall from the canopy in mapped areas. The weevil has been found consistently throughout the park and there is a high ratio of weevil evidence to the number of host plant fallout. Some localized host plant populations are heavily infested and great numbers of dead plants may be found on the ground, in which are found many weevils and cocoons. Some cocoons still harbor a pupa, others are already vacated.

Progression in this study is slow. The host plants have long life cycles, averaging ten years before going to seed. The weevil has a few generations within a year, but an infestation can be happening in a host plant for months before the signs become manifest, especially in the larger plants, which can support a substantial weevil population before death. It takes time and physical effort to map large geographical areas and to find and tag more individual host plants for monitoring.

Recently, in January 2002, I had the privilege of working with George Bañez of Selby Botanical Gardens and Dr. Marty Condon of Cornell College in Iowa. Dr. Condon had three students, Kim Hanson, Austin Reed and Ryan Ray, who were interested in helping me with my research while conducting their own work on the host plants. They mapped a number of new areas in the park, some along the river and some out in the prairie hammocks, and did a statistical analysis on the dispersion of the host plants among the trees. Their conclusion was that the host plants have a preference for large oak trees.

Dr. Condon and her students have returned to Iowa, but have left their maps in my possession. This means I can select more host plants for monitoring in new areas, as well as expand my search for the weevil. This equates to a tremendous amount of time saved and earlier input of information into my study, a substantial benefit. They in turn received an introduction to the unique habitats found in Myakka River State Park as well as an opportunity to do field research, which will be beneficial to the same good cause the school children are helping.

Wilderness and humanity have a unique relationship on this earth, and Myakka River State Park is a place where the two may meet and interact. Humans are products of the natural world, but separated by their conscious effort to understand, manipulate and determine their environments. As we grow in our understanding, I believe we realize more the importance of maintaining our connection with the natural world and supporting its wonders. There are many reasons the bromeliads in south Florida should be saved. They are microhabitats that support a range of arthropods, like islands in the sky. They are reservoirs of water for thirsty animals during the dry season. And of course, they are also just a delightful encounter. This can only be understood by going out and finding the bromeliads, singly in the woods or as a canopy garden, serenely perched upon the tree branches, green translucent leaves soaking up the sun.

My experiences in the park have given me a chance to learn about and to help in the effort to save valuable and threatened bromeliad species in Florida. The park has introduced me to a number of other people interested in the same organisms I am, and have opened up opportunities for communication and collaboration; we barter in knowledge and experience, and we all benefit from the exchange. I have also met people doing research on prairie burns, on bird populations, on insects, on reptiles...the park is home to a huge and complex web of living organisms. Anyone interested in learning more about the research, can visit my Web site at <http://savebromeliads.ifas.ufl.edu/field/> where associated maps, diagrams, photographs and greater details are to be found.

Myakka River State Park is a side trip well worth making. Stop by if you find yourself in the Sarasota/St. Pete area. There are many things to discover in Myakka.

Alachua, Florida

Interested in becoming Editor of the Journal?

It is time to for a change. I have decided to step down as editor of the *Journal of the Bromeliad Society*. The job is more demanding of time than I currently have available to give. This has led to the Journal being consistently behind schedule for most of the last three years, a situation that is undoubtedly frustrating to subscribers and most certainly has been to me.

Anyone interested in the position, or interested in suggesting someone for the position, should contact nominations chairman Bill Soerries at: William A. Soerries Sr., 2883 Florence Dr., Columbus, GA 31907, by telephone at 706-568-1156, or by e-mail at chic@mindspring.com.

Book Reviews

Jason R. Grant

Les Tillandsia et les Racinaea. *Albert Roguenant, preface by Aline Raynal-Roques, 2001. SIZE IN CM, 816 pages, soft cover. ISBN 2-7011-2821-8, French. 55 Euros. Order from: Belin, 8 rue Férou, 75006 Paris, France, www.editions-belin.com.*

The first book on bromeliads in over a century to be originally published in French, this handsome book devoted to the genera *Tillandsia* and *Racinaea* covers more than 700 species. It begins with chapters discussing their discovery and subsequent taxonomic study, distribution and ecology; cultivation; morphology; glossary; and systematics including a key to the species. Following these prose chapters is the bulk of the book where typically each page covers a single species. For each taxon there is a morphological description, notes on cultivation, a bibliography, and either a color photograph or line drawing. Appendices include a bibliography of cited texts, and one of the most useful elements in the book, being a four-language comparative lexicon (French, English, Spanish, German). As the author is a renowned horticulturist, the most important and relevant part of the book may be the portions covering cultivation in general and then the specific notes for each species. Additionally, the descriptive and illustrative key to the species is certainly the most comprehensive composed to date, combining the species of Smith & Downs (1977) with all the species published since then. While most of the photos represent plants in flower, too many are of sterile plants or line drawings, yet the reasoning to include them was valid in to show at least something even if a flowering individual was unavailable. There are also a number of species misidentifications but these matters are insignificant in the greater achievement of the volume as one of the most significant books on bromeliads. This book is essential not only for French-speaking horticulturists, amateurs, and biologists, but for anyone interested in *Tillandsia* as much of the text is universal. At roughly \$50 the book is also incredibly affordable, and therefore accessible to the general audience.

Ananas, Die Königliche Frucht. *Edition Braus, Heidelberg. Erich Hinrichs, November 1996. 34 cm, 120 pages, hard cover, ISBN 3-89466-179-8, German. Order from: Osiandersche Buchhandlung, Wilhelmstr. 12, D-72074 Tübingen, Germany; tel: (+49) 07071-9201-0; fax: (+49) 07071-9201-92; email: osiander@osiander.de; web site: <http://www.osiander.de>*

This may be one of the finest coffee-table books ever written on a bromeliad. However, the term "coffee-table book" may be inappropriate because that often implies only pretty pictures and no substance. This is not only a fine book to adorn your coffee-table, but one to leisurely peruse the illustrations and read the modern history of the pineapple. This is a fantastic marriage of a wide-ranging and impressive selection of pineapple illustrations, with accompanying

text depicting its use since it was introduced to Christopher Columbus during his second voyage to the Americas in 1493. Despite the fact that the primary text and illustration captions are in German, there is a complete English translation at the end of the book.

The illustrations (line-drawings, watercolors, oil paintings, photographs, etc.) come from a variety of sources including standard taxonomic works, horticultural magazines, travelogues, museum paintings, fruit-company advertisements, and recently taken photographs. They date from the first known illustration of a bromeliad by a European, Oviedo in 1520, to a Redouté painting, to a recent series of photographs depicting the entire operation of cultivating the pineapple in the Dominican Republic. In all, illustrations by various artists from Cuba, England, Germany, Holland, Panama, the Philippines, Singapore, Spain, and the United States (Hawaii). This book is heartily recommended for the true bromeliad enthusiast and book collector.

Páramos, a checklist of plant diversity, geographical distribution, and botanical literature. Memoirs of the New York Botanical Garden, Volume 84. *James L. Luteyn, 1999. 26 cm, 278 pages, hard cover, ISBN 0-89327-427-5, English. Order from: Scientific Publications Department, The New York Botanical Garden, Bronx, New York, 10458-5126, USA, (718) 817-8721; fax (718) 817-8842; email: scipubs@nybg.org.*

The páramo is a unique ecosystem of northern South America (Venezuela, Colombia, Ecuador, and Peru) and adjacent Central America (Costa Rica and Panama). It is defined as the vegetative area at 3000-5000 m in elevation between the upper tree line and the upper limit of vegetation. It is a species and endemic-rich region. In the Bromeliaceae, the genus *Puya* particularly plays an important role in the composition of the flora. This book is an essential guide to the vegetation of these upper elevation areas. The book has a full Introduction to the Páramo Ecosystem, a Checklist of Páramo Plants, a Gazetteer of Páramo Localities, and Botanical References to Páramo.

The checklist of the flora comprises 3,399 vascular plant species (ferns and fern allies, gymnosperms, and angiosperms), and 1,298 nonvascular species (lichenized fungi, mosses, and hepatics). The Bromeliaceae (pages 100-101) consists of 6 genera and 78 species. The genera include *Greigia* (8 species), *Guzmania* (7 species), *Pitcairnia* (4 species), *Puya* (48 species), *Racinaea* (1 species), and *Tillandsia* 10 species).

Bromelienstudien I. Neue und wenig bekannte Arten aus Peru und anderen Ländern (23. Mitteilung). [Bromeliad studies I. New and little known species from Peru and other countries] *Elvira Gross. Steiner: Stuttgart. Tropische und subtropische Pflanzenwelt 95. 1997. 23.5 cm, 41 pages, soft cover, ISBN 3-515-07083-4, German. Order from: Koeltz Scientific Books, P.O. Box 1360, D-61453 Koenigstein, Germany; Tel: (+49) 6174-93720; Fax: (+49) 6174-937240; email: koeltz@ibm.net; web site: <http://www.koeltz.com>*

Eight new taxa of bromeliads are described as new including: *Encholirium crassiscapum* E. Gross, *Pepinia verrucosa* E. Gross [= *Pitcairnia elvirae* D.C. Taylor & H. Rob., Harvard Pap. Bot. 4: 207. 1999], *Pitcairnia koeneniana* E. Gross & Barthlott, *P. roseoalba* E. Gross & Rauh, *P. roseoalba* var. *rubra* E. Gross & Rauh, *Guzmania alliadora* E. Gross, *G. remediosensis* E. Gross, and *G. viridiflora* E. Gross. Also discussed are *Pitcairnia dracaenoides* Luther, *Puya prosanae* P. Ibsch & E. Gross, and *Cryptanthus scaposus* E. Pereira. Each species is depicted by a black and white photograph of living material.

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Three Bromeliads Blooming at Marie Selby Botanical Gardens

Harry E. Luther

Aechmea paradoxa was originally described as a member of the genus *Wittrockia* in 1989; in 1997 its author, Elton Leme, transferred it to *Aechmea*. It is a poorly known species recorded from only two collections. The pictured specimen (figure 28) is a descendent of the paratype collection from the Rio de Janeiro Botanical Garden. We grow it rather shady and moist.

Aechmea patriciae (figure 29) was first described in the Journal (Vol. 49, No. 4, 1999) but was not illustrated with a photo. Better late than never. This species is from hot, wet lowland Amazonian rain forest in Ecuador, where it grows with *Aechmea chantinii* and *A. longifolia*.

Aechmea rubrolilacina (back cover) is a problematic plant. It resembles and has several important features in common with both *Portea* and *Aechmea*. Although only described by Leme in 1993 plants have apparently been in limited North American horticulture for a much longer period, long enough to have made garden hybrids with *Portea petropolitana* in Florida. All of these plants are tough, spiny, big and are beautiful specimens for subtropical landscapes.

Sarasota, Florida

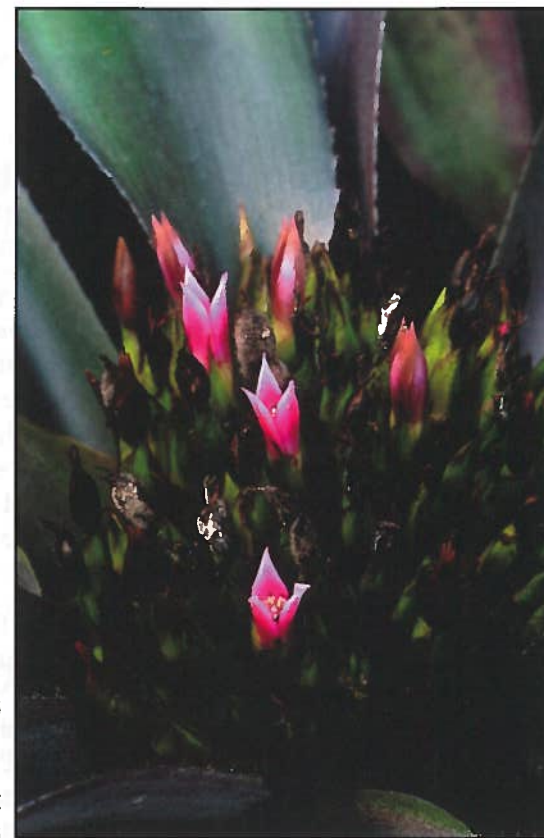


Figure 28
Aechmea
paradoxa
in bloom at
Selby Gardens

Vern Sawyer



Vern Sawyer

Figure 29 Flowering *Aechmea patriciae* at Selby Gardens

May Moir, 1907-2001

Thomas U. Lineham

Mrs. Mary Arstead Neal Moir, gardner and plant pioneer, died on September 7th having spent several months in a care home as the result of injuries from a fall. News of her death was received only in recent days.

May and her husband, Goodale, wrote extensively about many aspects of horticulture, particularly bromeliad horticulture, for the *Journal* and other publications. Their interest in bromeliads began with their introduction to the *Journal* (then *Bulletin*) during the 1950's. They corresponded with Mulford Foster of Orlando, Florida who sent them seeds of *Tillandsia cyanea*. May said she scattered them on tree fern fiber having no idea that the seedlings would grow in the favorable Honolulu climate to spread, as a friend observed, "like Mondo grass." With that introduction to bromeliads, they developed a large collection to display in their showplace garden.

As both artist and gardner, May created floral sculptures for the Honolulu Academy of Arts for fifty years. Her huge creations, many displaying bromeliads, stood in the entry courtyard. She described many of those imaginative and decorative works for *Journal* readers beginning in 1984 and continuing through 21 articles. Her book, *The Garden Watcher*, that she revised in 1989, includes many of those illustrated articles, inspiration for flower arrangers of the present.

May was a generous, hospitable hostess always willing to take time from her many activities to receive visitors to her garden and to share her plant knowledge. I greatly regret reporting the loss of another bromeliad friend. She always signed her letters, "Aloha, May." So I shall offer that greeting in her memory.

I thank May's daughter, Peggy Vollmann of Honolulu, for telling me of May's last days. She wrote, "...I keep house and garden going and people continue to visit." Thanks also to old friend Hatsumi Maertz of Pearl City for sending a copy of May's obituary to Heidi Bornhorst from the Honolulu Advertiser. ...T.U.L.



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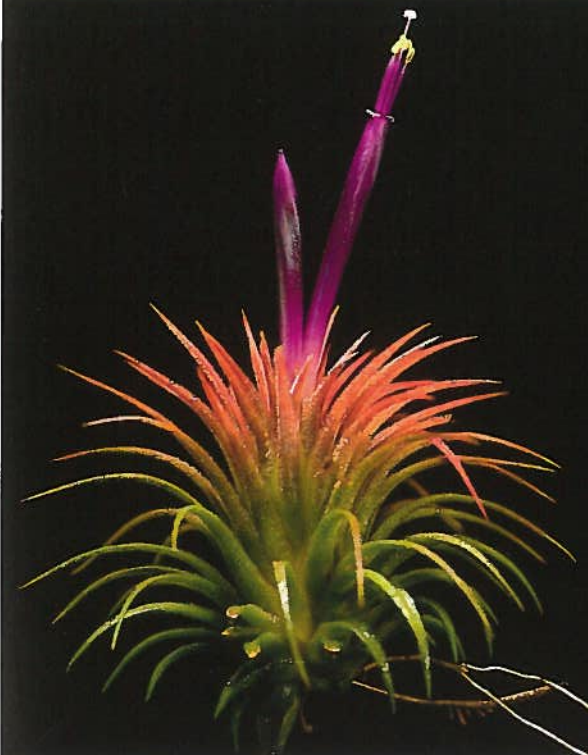
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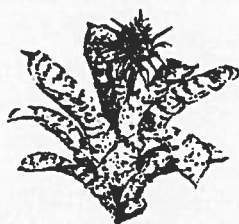
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*Aechmea
rubrolilacina*
Leme



Photograph by Verne Sawyer

One of the less common aechmeas in cultivation, *Aechmea rubrolilacina* from Brazil is shown in bloom at Selby Gardens and briefly discussed in text beginning on page 40.

Calendar

- 20-21 April The Greater New Orleans Bromeliad Society's annual standard show and sale will be held at Lakeside Mall, Metairie, LA. Hours 1-10 p.m. on Saturday, 10 a.m. to 4 p.m. on Sunday. Contact: Carol Hertz, 504-486-8190 or Fred Ross 504-891-9301.
- 26-28 April The Sarasota Bromeliad Society will hold its 22nd annual Show and Sale at Selby Gardens in Sarasota, Florida. The show will be open to the public from 10 to 4 on April 27 and 28. Plant sales will be open from 10 to 5 on Friday & Saturday, and from 10 to 4 on Sunday. There is no charge for the show other than the regular admission fee to Selby Gardens. Contact: Bill Timm, 2030 Leryl Ave, North Port, FL. 3428. PH: 941-426-1133
- 4-5 May The La Ballona Bromeliad Society and the Sunset Succulent Society will be holding their combined show and sale at the Veteran's Memorial Auditorium, 4117 Overland Ave. (corner of Overland & Culver Blvd.) in Culver City. The hours are 10 to 4:30 on Saturday and 10 to 4 on Sunday. For information call Fred O'Connor, 310-230-4262.
- 10-12 May The Bromeliad Society of Central Florida will hold its 27th Annual Mother's Day Show & Sale at The Florida Mall, 8001 S. Orange Blossom Trail, Orlando, FL. Hours for this BSI judged event are 10 a.m. to 9 p.m. May 10-11 and Noon to 6 p.m. May 12. Admission is free. Contact: Eloise Beach, 407-886-8892, FloridaPRO@aol.com
- 13-20 May "Bromeliad Beach Party", the 15th World Bromeliad Conference, will be held at the St. Petersburg (Florida) Hilton Hotel. Look for the registration form with details inside the JOURNAL.