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Cover photographs. Front: *Pitcairnia billbergioides* L.B. Smith. Photography by Dr. Werner Rauh. His description is on page 195. Back: *Tillandsia laui* Matuda photographed by Dr. Heinz Hemker and briefly described on the back cover.

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Pitcairnia billbergioides

Werner Rauh

Pitcairnia billbergioides L.B. Smith is a very rare but extraordinarily attractive species. It has been known until now only from the type locality in low scrub on slopes near the Hacienda Porculla, between Olmos and Jaen, at an altitude of 1800–2000 M (Dptm. Lambayeque, northern Peru; *Ferreyra 14161*, March 1961).

In February 1988, we found this species further northwards in the valley of Canchaque-Huancabamba (above the village Canchaque) at an altitude of 1800–2300 m on rocky slopes in association with many ferns, mosses, lichens, peperomias and many other herbs. Our plant *(Rauh 69 153)* differs only in some points from the original description. The following description is based on our Canchaque material:

Plant growing in small bushes, flowering up to 60 cm high, with a thick, mostly subterranean stem, covered with the remains of brown, old leaves, branching from the base. *Leaves* of the rosette dimorphic: alternating basal reduced spiny leaves with normal green ones. The first are persistent, up to 6 cm long, pungent, spinose-serrate, dark brown; the other ones are deciduous above the short sheath along a straight transverse line, linear, acuminate to a pungent apex, slightly contracted towards base, up to 35 cm long, 2 cm wide, flat, entire or bearing a few weak setiform spines at the persisting part of the leaf, green and nearly glabrous on both sides. *Scape* erect, up to 50 cm high, 0.5 cm thick, densely white floccose. *Scape bracts* also heteromorphic: the basal ones (following the spiny rosette leaves) are reduced, lanceolate-elliptic, acuminate to a long, pungent apex, otherwise entire, green, persistent; the leaves of the middle part of the scape are similar to the rosette leaves, subfoliate, with a long (up to 20 cm) deciduous blade and a short persistent part, often somewhat spinose serrate; the highest scape bracts are lanceolate, long acuminate, going over gradually into the floral bracts. *Inflorescence* simple, erect, densely corymbiform, up to 10 cm long and 7 cm in diameter at apex, densely white floccose. *Flowers* erect to suberect at anthesis, up to 7 (-8) cm long, nearly radial, very short pedicillated. *Floral bracts* strict, narrowly triangular-lanceolate, pungent, shorter than the sepals, the lowest up to 5 cm long, green and densely lepidote, the upper ones shorter, glabrous and reddish. *Sepals* very narrowly triangular, long acuminate, 4 cm long, strongly carinate, the posterior ones small alate, red. *Petals* lingulate, acute, up to 7 (-8) cm long, naked, the tips recurved, bright red. *Stamens* exserted with flat filaments. *Style* much longer than the anthers with red stigmas. *Ovary* 4/5 superior; ovules caudate.

Collection number: *Rauh 69 153* (Feb. 1988), in Herb. Inst. System. Bot. Univ. Heidelberg (HEID).

Author

Fig. 1
Pitcairnia billbergioides.
Dr. Lyman B. Smith described this plant in 1963 from a specimen collected by R. Ferreyra in 1961. Dr. Rauh collected the specimen shown here in 1988 at some distance from the original site in Peru but found none at the type locality. The re-collected plant is different from the type in minor respects.

Habitat and distribution: valley of Canchaque on the Pacific side of the Andes, in an altitude between 2000 and 2500 m (N-Peru).

We did not see the plant at the type locality, about 100 km to the south. The main difference between the description of L.B. Smith and ours is the length of the stamens. According to Smith the stamens are included, in our plant they are long exserted.

Institute for Systematic Botany and Botanical Garden of the University of Heidelberg, West Germany

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ADVERTISEMENTS AND NOTICES to appear in the January-February 1990 *Journal* must reach the editor not later than 1 November 1989. —Ed.

Guzmania sanguinea var. *comosa*

Harry E. Luther

Some bromeliads enjoy a lengthy period in cultivation before they are properly identified or described. Occasionally, species named from horticultural material have never been re-collected in the wild (e.g. *Puya hortensis* L.B. Smith, *Billbergia buchholtzii* Mez, and *Wittrockia amazonica* [Baker] L.B. Smith). The odd but attractive guzmania shown in figure 2 has been in and out of horticulture for nearly 30 years.

The first record of this taxon in cultivation appeared as a short article in the equally short-lived publication *Bromeliad Papers* published by Alex D. Hawkes in the late 1950s and early 1960s. Unfortunately it was misidentified. This first notice is reprinted in full (following a tradition set forth by its author) from volume 2, number 3, July 1960.

Guzmania eduardii. At the regular meeting of the Bromeliad Society of South Florida for July, the president of the organization, Nat DeLeon,

Franz Georg Gruber

Fig. 2.
Guzmania sanguinea var. *comosa* with its "feather-duster" tuft has been known and misidentified for at least 40 years, but Mr. Luther has now described and named it. The epithet "comosa" means, "bearing a tuft of hairs or leaves," according to W.T. Stearn.

brought an extremely unusual bromeliad for the exhibition table. A plant collected by him in Colombia, it has provisionally been determined as *Guzmania eduardii*[1] André ex Mez. According to Smith's *Bromeliaceae of Colombia* (1957), this species has been gathered on several occasions in that country. Mr. DeLeon's specimen was a very pretty thing with broad foliage and a sunken cluster of proportionately large flowers with white petals. But the extraordinary thing about this plant was the "feather-duster"-like structure sticking up out of the middle of the inflorescence, to a height of several inches. With a vivid scarlet stalk, its apical portion was set with a series of largish scarlet bracts, the purpose of which we were unable to fathom! Careful examination of this odd structure did not disclose any evidence of abortive flowers at the bases of these "aerial" bracts, as might have been expected. No mention of this condition is made in Dr. Smith's description of *G. eduardii,* and we know of no comparable structure elsewhere in Bromeliaceae.

This misidentification probably had its origin with a specimen at the Smithsonian Institution collected in Colombia in 1944 that was first determined as *Guzmania eduardii* André "aberrant." By the end of 1950, the identification had been changed to *G. sanguinea* (André) André ex Mez. As the specimen is rather incomplete there was certainly cause for confusion.

Apparently the DeLeon plant did not persist in cultivation.

The next appearance of this odd plant in print, and beautifully photographed, was on page 260, Vol. XXXI, (1981) of the *Journal of the Bromeliad Society.* This article by Jeffrey Kent stated that the plant had been collected above Tumaco in southwest Colombia. Here it was identified as the long-lost *Guzmania sanguinea* var. *erecta* André.

The type specimen and illustration of var. *erecta* are very poor, old, and shattered. It is impossible to clearly determine the relationships of this taxon but it is clearly **not** with *Guzmania sanguinea* because var. *erecta* has a scapose, short cylindric inflorescence. The overall habit suggests that it may be conspecific with *G. fusispica* Mez & Sodiro. The illustration taken from Bromeliaceae Andreanae, plate XVII (fig. 3) clearly contrasts *Guzmania (Caraguata) sanguinea* with its proposed variety.

Shortly before Mr. Kent's expedition, Franz Gruber of the nursery Orchideas S.A. in Colombia introduced a limited number of plants of this taxon into Florida. These were also identified as *G. sanguinea* var. *erecta.* They have remained in horticulture but have never been widely distributed because of their limited potential for asexual propagation. Evidently no one has attempted to grow them from seed.

[Continued on page 204]

1. See J. Brom. Soc. 39, no. 2: cover photograph and description, p. 65.

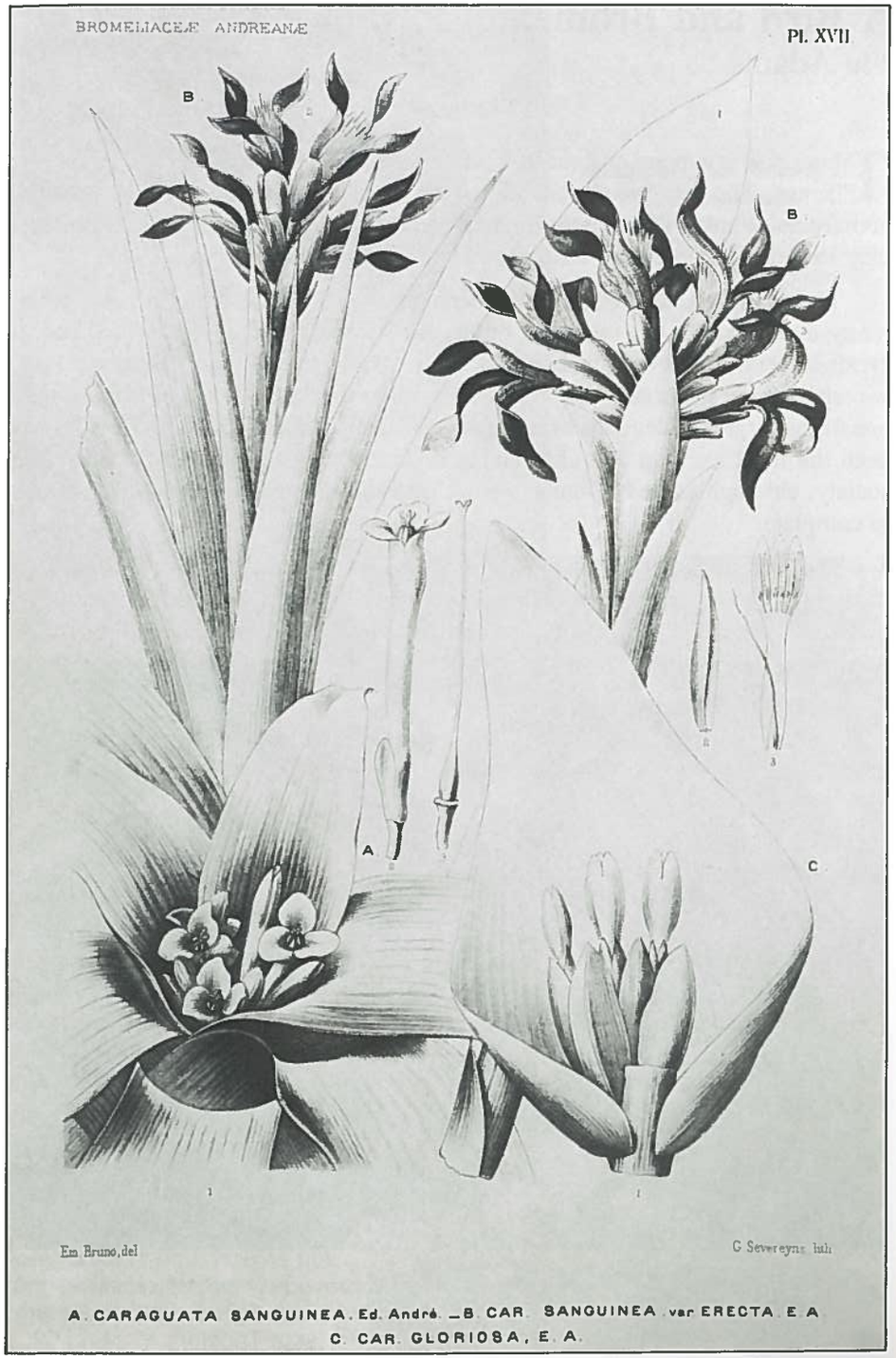


Fig. 3.

A Bird and Bromeliad Paradise

Flo Adams

There is a new point of interest for bromeliad enthusiasts at the zoo in Dallas, Texas. The new Neo-Tropical Aviary presents bromeliads, ferns, orchids, and aroids, along with some of the most colorful species of neotropical birds as they exist in their habitats, all from Central and South America.

The Greater Dallas-Fort Worth Bromeliad Society has had the rare opportunity to work with the members of the Bird Department at the Dallas Zoo to create a beautiful and unusual home for the birds. As a result, the 900-square foot, two-story flight room has been completely renovated and newly landscaped with one of the largest collections of bromeliad species to be found in an aviary. It has been the most exciting and challenging conservation project undertaken by the society, although at the beginning we did not realize that it would take 18 months to complete.

The first step after making a comprehensive study of the physical conditions in the aviary was to get the aviary curator and the zoo director to approve a renovation plan. That accomplished, all of the existing plants except for the

Flo Adams

Fig. 4. The Dallas Zoo aviary renovation is approved by prized resident, the Peruvian cock-of-the-rock (the orange and black figure right of center). Some of the specimens are *Neoregelia* 'Perfecta Tricolor', *N. olens* 696, *N.* 'Fireball', and *Vriesea elata* (far right).

Fig. 5
The upper pool feeding the waterfall is decorated with birdsnest fern, *Neoregelia* 'Perfecta Tricolor', *Oncidium spacelatum* among other specimen plants.

photos by Flo Adams

Fig. 6
On the back wall, *Neoregelia olens* 696 is enjoying the spray from the waterfall. *Vriesea philippocoburgii, Guzmania* × *wittmackiana,* and a maidenhair fern are in the foreground. The careful planning of the bromeliad arrangements emphasizes the exceptional detail of the masonry.

30-foot ficus trees were removed. The ficus were pruned to admit more natural light. Next, a new, computerized air-conditioning system capable of duplicating and maintaining the changing seasons in the tropics was installed. After that, the soil in the ground floor area was removed to a depth of two feet and replaced with a loose, quick-draining mixture of Canadian sphagnum peat moss, coarse sand, and small lava rock pebbles. Then, the entire aviary was scrubbed and disinfected. The last step before we could bring in any plants was for the zoo people to get the waterfall, a dripline water system above the rock wall, and a misting system working to create a high-humidity climate.

According to our plan, the plants are being organically grown and they receive a daily bath to wash off the bird droppings. Tillandsias are mounted on the tree branches and rock walls. Neoregelias are planted among the rocks above and around the waterfall where they can get the best light. Guzmanias, hohenbergias, and vrieseas are displayed on and near the rocks and on the ground floor area around the pool. Billbergias and aechmeas can be found growing on the rock walls. Nidulariums are in the low light areas on the ground floor and cryptanthus have found a new home in sunny little areas near the glass walls.

For the benefit of the public, we selected bromeliads with colorful foliage as well as those with unusual blooms. We included some personal favorites, some unusual specimens, and some of the best known. There are more than 200 different kinds of bromeliads growing now in the aviary.

The star resident is the Peruvian cock-of-the-rock *(Rupicola rupicola)* who makes his home among bromeliads such as *Aechmea* 'Little Harv', *Billbergia braziliensis, Guzmania bismarckii, G. eduardii, Hohenbergia rosea,* the extra-large *Neoregelia concentrica* called "Bullis Big Blue," the scented *Tillandsia streptocarpa, T. bergeri, Vriesea elata, V. sceptrum,* and the colorful *Wittrockia superba.*

We have conducted bromeliad culture workshops for the aviary workers and volunteers and developed interpretative materials for the guided tours. This activity produced new members for our society; personnel and volunteers from other zoo departments became interested in the bromeliads and some asked to work on the aviary project. One young man who used to work as a volunteer once a week came two and three days a week and signed up as a new member.

As with all projects, there were delays and setbacks, but we also had a lot of good luck. We were sad that some birds were lost when a flood overturned the cages used as temporary housing. We worked when the waterfall pump didn't work and when a broken water pipe flooded the ground floor. We suffered through high humidity and heat while the air conditioning system was being programmed and adjusted. We laughed ourselves silly when we found ourselves and the bird keepers climbing the rock walls and hanging on for dear life. We had a great time and certainly celebrated on opening day.

[cont. on page 204]

Tillandsia '88

Karel Willinger

The town of České Budějovice is the centre of bromeliad growing—with particular emphasis on tillandsias—in Czechoslovakia and that is why we decided to hold the conference "Tillandsia '88" there on the 15th and 16th of October 1988. We had a meeting of Czech friends of *Tillandsia* in Ostravara in 1984 but this was to be an international meeting. Organizing this conference was very difficult because it was to be the first of its kind. Both the Czech Garden Union and the Czech Committee of the Science-Technical Company helped us very much. There is no bromeliad organization in Czechoslovakia but tillandsia fanciers are members of the orchid club and that club is part of the Czech Garden Union.

There are tillandsia plants and books about that genus in our country but it is very difficult to buy them. The main sources of both plants and books are our neighbours in West Germany and Austria, although not long ago a small group of orchid club members visited Cuba and collected plants there.

Most of the bromeliads are concentrated in the botanical gardens of Prague and Bratislava and in an arboretum of the Agricultural College in Brno. There are ten large, private collections of tillandsias and other bromeliads and many smaller collections maintained by growers who have glass houses. With this many growers you can see why not only the experts were interested in this conference.

About 150 men and women took part in the conference. They were from Czechoslovakia, East and West Germany, Austria, and Hungary. Professor Doctor Werner Rauh of Heidelberg, Mrs. Renate Ehlers of Stuttgart, and Mrs. Lieselotte Hromadnik of Kritzendorf near Vienna were among most helpful participants. The plant exhibitions contributed by Mrs. Ehlers and Mrs. Hromadnik were very important and interesting. The lectures were on a good level and very good translations from Czech into English were secured.

The speakers and their topics were:

Ing. Petr Staý	A trip to Mexico
Mr. Karel Willinger	A trip to Cuba and finding *Tillandsia turquinensis*
Dr. Jan Gloser	Ecological physiology
Ing. Jarmila Matoušková	Growing *Tillandsia* in the arboretum of the Agricultural College, Brno
Mr. Bohumil Vondruš	Sowing tillandsia seeds
Ing. Jaroslav Prášek	Forms of *Tillandsia ionantha*
Prof. Dr. Werner Rauh	The tillandsias of Ecuador
Mrs. Lieselotte Hromadnik	The tillandsias of the Bolivian Andes and Brazil
Mrs. Renate Ehlers	Searching for *Tillandsia* in Mexico and Brazil

The Ehlers gave on the occasion of this conference 100 pieces of various *Tillandsia* from their own collection to their friends. It really shows that among tillandsia-lovers, wherever they live, there are no frontiers or language barriers, but friendship.

České Budějovice
Czechoslovakia

Guzmania sanguinea var. *comosa* *[continued from page 198]*

Finally, after more than 44 years since its discovery (and nearly 30 since it was introduced to horticulture), this confusing plant has a name, *Guzmania sanguinea* var. *comosa* Luther, published in Selbyana, volume 11 (1989). This new variety differs from the type of the species by its larger floral bracts, with the axis of the inflorescence elongated above the flowers, and with a sterile tuft of bracts at the apex.

All growers possessing this guzmania are urged to alter their tags.

M.B. Foster Bromeliad Identification Center
Marie Selby Botanical Gardens, Sarasota, Florida

A Bird and Bromeliad Paradise *[continued from page 202]*

The great success of this project came from the splendid cooperation of the Bird Department personnel, the volunteers, and our society members. Many other individuals and organizations gave us superb assistance: the Tarrant County Bromeliad Society, the Southwestern Fern Society, the Greater North Texas Orchid Society; Fred Berry who found the big, beautiful and blooming heliconias; Dewey Fisk, who selected the most unusual aroids from members of his aroid society and arranged for those plants and the heliconias to be put on the Texas-bound freight truck; Harvey Bullis, Jeffrey Kent, and Don Beadle who sent especially selected plants from their nurseries; Alfredo Lau of Cordoba, Veracruz, Mexico who sent more than 500 tillandsias.

The Neo-Tropical Aviary was opened officially to the public on June 20, 1989. The grand opening of the refurbished Bird/Reptile House complex will be held in October. Since the Greater Dallas-Fort Worth Bromeliad Society will be hosting the Southwest Bromeliad Guild Show during October 27-28 in Dallas, all registrants of the Guild show will have the opportunity to visit the aviary.

Arlington, Texas

Necrology of Honorary Trustee Robert G. Wilson, a Reflection of an Individualist and Plantsman

Jack Percival

This past spring, Robert G. Wilson died in his adopted homeland, Costa Rica. Death came at his much-loved Las Cruces Tropical Botanical Garden nestled high in a premontaine rain forest. Those of us who have been in his company knew him as plain Bob, not Mr. Wilson. We respected him for his vast knowledge of horticulture and his prodigious memory of the details of taxonomy.

A long time ago, Bob and his wife Catherine owned and operated a successful exotic plant nursery in Florida. Having heard about the fine climate of Costa Rica and after investigating it, he decided to close the nursery, move his most valuable specimens to Costa Rica, set up a tropical garden, and explore the possibility of growing tea commercially. As it turned out, the tea project was not a success.

With that venture out of the question, Mr. Wilson turned to establishing his tropical garden. It was destined to become one of the largest and finest in Latin America. Naturalists from all over the globe have come to view and study the landscaping and the tropical plants themselves.

But, what manner of man was Bob Wilson? For those who did not know him, a few personal reflections will suffice. My first exposure to him was ten years ago. One thing most vivid still is my impression of a soft-spoken but individualistic botanist who knew how to landscape and how to grow what he landscaped. He seemed to mystify our group of naturalists as he told of his building the garden, of the past happy days in the area, and of the details, some pleasant and some not so, of his signing over his ownership of the garden (some 300 acres) to the Organization of Tropical Studies. It was during this same visit that I noticed Catherine's poor health, although she was charming and possessed of a good sense of humor. Several years later, she passed away and her body was buried in the garden with or without legal sanction. Bob refused to discuss the matter. An individualist? Indeed.

On my third visit to help renovate the garden, I was saddened to observe the hard-working director of the past 20 years in poor health and declining rapidly. His productive years were over.

His replacement, Luis Diego Gomez, is a talented native son. Sr. Gomez has tackled the task of renovating the long-neglected garden with enthusiasm. In 1987, the Organization of Tropical Studies placed a plaque in the garden honoring Mr. Wilson for his many years of devotion to the garden. How fortunate that the tribute was made while he was alive. Robert G. Wilson's grave is beside his wife's in the garden.

San Diego, California

Another Giant *Dyckia* Mystery

Lyman B. Smith

Racine Foster flowered this giant *Dyckia* at the same time that she did *Dyckia racinae** but I was not able to describe it until later. Again, Michael A. Spencer set up the plant and took the photos.

***Dyckia polycladus* L.B. Smith, sp. nov.**

A *Dyckia selloa* (K. Koch) Baker, cui affinis, foliorum laminis utrinque inter nervos minute albo-lepidotis, inflorescentia ample tripinnatim paniculata differt.

Plant stemless, nearly 2 m (7 feet) high. *Leaves* rosulate, over 40 cm long; sheaths pale; blades 2 cm wide, finely white-lepidote between the nerves on both sides, laxly serrate with curved spines 5 mm long. *Scape* terminal, erect, 10 mm thick at apex; scape-bracts subfoliaceous, exceeding the internodes but exposing most of the scape. *Inflorescence* laxly and amply tripinnate, densely white-flocculose; primary bracts very narrowly triangular, much shorter than the sterile bases of the 50-cm-long, much divided branches. *Floral bracts* ovate, acute, 4 mm long at anthesis; pedicels very short at anthesis; flowers perfect. *Sepals* suborbicular, 4 mm long; petals spatulate, yellow; stamens and stigma slightly exserted.

Brazil: almost certainly Rio Grande do Sul: locality unknown, *Foster 3096* (holotype US, isotypes GH, NY, P).

Correction note: The collection number of *Dyckia racinae* is *Foster 3095*, not *3094*.

Smithsonian Institution
Washington, D.C.

**J. Brom Soc. 38:248-249.*

Fig. 7
Dyckia polycladus differs not only from *D. selloa* in its amply tripinnate inflorescence but also from the other two giants, *D. racinae* and *D. hebdingii*.

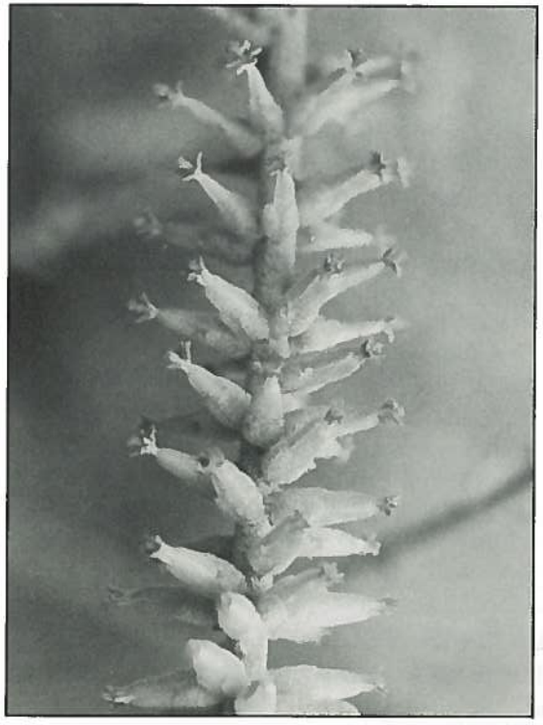


Fig. 8
Dyckia polycladus inflorescence.

photos by Michael A. Spencer

New Books

There have been several months without book reviews because (1) we had none to review and (2) when they came in there was no space. Now we have six books to report. This time, we have the amazing luck to have four books for the hobbyist and general reader as well as an excellent addition on tillandsias to the *Flora of the Guianas* by our contributor, Eric J. Gouda, and volume 15 of Rogers McVaugh's imposing *Flora Novo-Galiciana.* –TUL

Growing Bromeliads, by The Bromeliad Society of Australia, Inc. 112 p., color and b&w illus; 24 cm. 1988. US $12.95, paperback. Orders from American readers should be addressed to: International Specialized Book Service, 5602 N.E. Hassalo St., Portland, Oregon 97225 or to local book stores. All other orders should be addressed to: Kangaroo Press, Pty. Ltd, 3 Whitehall Rd. (P.O. Box 75) Kenthurst, N.S.W. 2156. Quantity discount may be available. The address of the society is: B.S.A., Inc. P.O. Box 340, Ryde, N.S.W. 2112, Australia.

This book was written, illustrated, and edited by 18 members of the B.S.A. "to provide an insight into bromeliads from the viewpoint of the practical horticulturist. . . ." The book will remind some readers of Victoria Padilla's **Bromeliads** with its general arrangement, preliminary information, and descriptions of genera. It reports the individual author's recommended growing techniques and describes no more than 30 species and hybrids of each of the commonly cultivated genera.

Some chapters are longer and have more detail than others. Most of the color pictures are very good and relate well with the text. In the chapter on tillandsias, for example, 17 of the 29 species described are illustrated. There are 21 neoregelia descriptions followed by seven hybrids and cultivars. All of the latter are illustrated but only three of the species. Chapters on propagation, biology, variegation, and pests and diseases add to the usefulness of this book. It includes a glossary and an index.

There is the usual confusion about the nomenclature of hybrids and cultivars (single quotes or no quotes) that dogs most of us. The eventual publication of a new edition of the cultivar register may save us from this error. The authors and editors are to be congratulated on having produced this useful work. Its applicability is certainly not limited to Australia. Recommended for hobbyists and for bromeliad society libraries.

Margaret Mee: in search of the flowers of the Amazon forests. 302 p., extensively illustrated with colored and black and white drawings, paintings, photographs; maps; 28 cm. cased. Includes glossary, recommended reading,

and an index of colored illustrations. Woodbridge, Suffolk, Eng.: Nonesuch Expeditions, Ltd.; 1988. Order from: Myron Kimnach, 5508 N. Astell Ave., Azusa, CA 91702, $41.00 postpaid, or from The Antique Collector's Club, Ltd., 5 Church Street, Woodbridge, Suffolk IP12 1DS England (price not available).

Margaret Mee was an Englishwoman who lived in Brazil with her husband, a commercial artist, for many years. She was a plant explorer, conservationist, and preeminent botanical artist. Between 1956 and 1988, her eightieth year, she made 15 journeys into Amazonia. This book consists of her diaries of those trips with notes by Editor Tony Morrison. The illustrations are almost without exception her work. They are arranged to appear in direct support of the text instead of being gathered into sections, a laborious task that could have been done only with the author's help.

This is an adventure story full of enthusiasm for the country but sad in reporting the destruction of the land, its people, animals, and vegetation. We are further saddened to learn that Mrs. Mee was killed in November 1988 just as this book was being released.

The 93 color reproductions of the paintings and sketches are especially fine. Among them are 20 of various bromeliad species including *Aechmea polyantha,* which has never been found since collected by Margaret Mee. In several cases her paintings are the only illustrations available for several species, for example, *Neoregelia margaretae.*

This book is unusual because it combines her personal views, trained observations, and superior art. I kept reading on and on to see what would happen next and at the same time admiring the marvelous detail of her art. You owe it to yourself to get a copy, or at least to persuade your library to obtain one.

Tillandsias; a Growing Guide, compiled by Kurt and Val Tintner for The Bromeliad Society of New South Wales. 30 p., illus.; 21 cm; 1989. Aust. $5.00 plus postage, paperback. Quantity discount. Order from Mrs. Alice Williams, 132 Anzac Ave., Collaroy Plateau, N.S.W. 2098, Australia. Make international money order or bank draft payable to the society. Mrs. Williams is the society secretary.

The Bromeliad Society of New South Wales has recently published this highly informative booklet on tillandsia culture and growing conditions. Basing their information in part on the Smith & Downs *Flora Neotropica* (14/2 Tillandsioideae) and on Werner Rauh's *Bromeliads for Home, Garden and Greenhouse,* the compilers have listed 246 species and varieties of *Tillandsia* by geographic regions: Eastern and Western South America, the Central Americas. They have thoughtfully included 29 tillandsia-like vrieseas using information from Peter Tristram.

[cont. on page 220]

Vegetative Propagation of *Aechmea fulgens* in vitro

R.L.M. Pierik,* P.A. Sprenkels and J.M. van der Velden

Summary. Shoot tips of *Aechmea fulgens* Brongniart were isolated on solid media. Shoots that started to grow were transferred to liquid media placed on a rotator, to study axillary branching. By optimizing the nutritional, hormonal and physical growth factors a shoot multiplication rate of 10 was obtained after 12 weeks. Axillary-formed shoots were subsequently rooted in vitro and transferred to soil. The resulting plants, also in the flowering stage, were uniform and normal as no callus and/or adventitious buds were formed during axillary branching.

Introduction. *Aechmea fulgens* Brong. (Bromeliaceae), is an attractive pot plant in The Netherlands. This species is normally propagated by seeds, resulting in a heterogeneous population. For that reason cloning in vivo or in vitro is very attractive for reproducing selected genotypes from seedling populations. Since cloning in vivo is too slow and therefore economically not reasonable, an in vitro method was developed which will be described in this article.

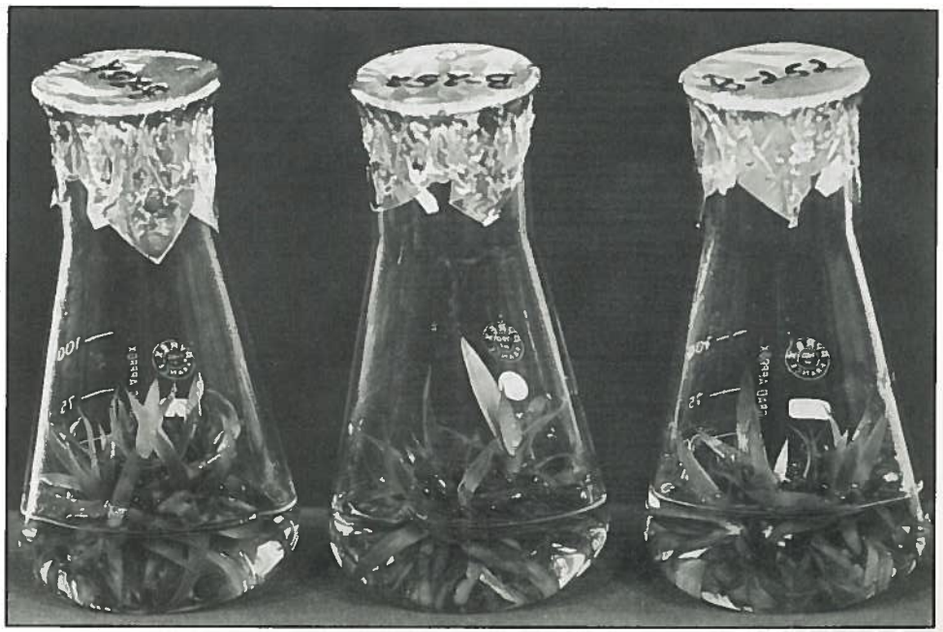
Material and methods. Shoot tips were isolated from axillary-formed shoots located at the bases of healthy flowering plants; this plant material was obtained from a commercial grower (van der Velden, St. Oedenrode, The

R.L.M. Pierik and others

Fig. 9 Flowering *Aechmea fulgens* plants, micropropagated by axillary branching in liquid media and rooted in solid media.

R.L.M. Pierik and others

Fig. 10.
Axillary branching in *Aechmea fulgens* as influenced by the BA concentration. Left: BA level (0.05 mg/1) too low. Right: BA level (0.08 mg/1) optimal.



R.L.M. Pierik and others

Fig. 11
Shoot multiplication through axillary branching in liquid media after 12 weeks.

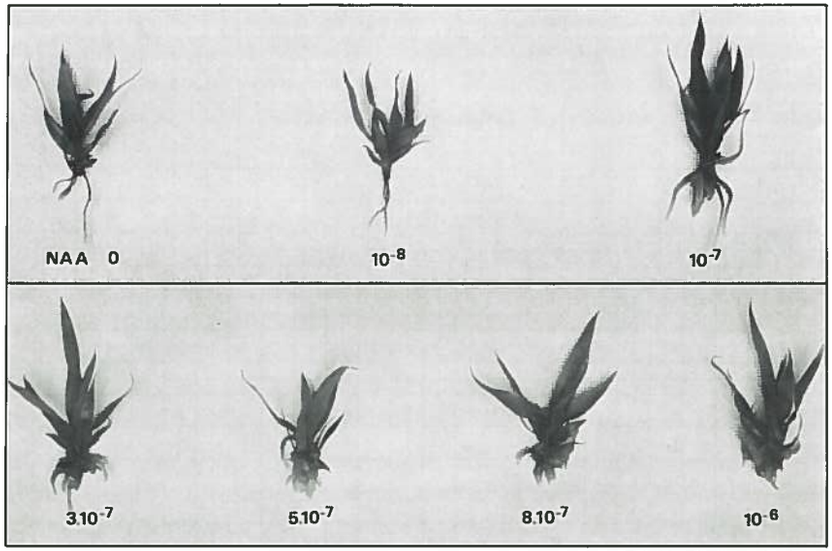


Fig. 12
Rooting of axillary-formed shoots in vitro on solid media after 6 weeks. Optimal rooting occurred on a medium with NAA 10^{-7} (0.1mg/1).

Netherlands). After thoroughly rinsing the shoots with soap, the outer leaves were removed. The shoot tips (with several leaves and leaf primordia) were then sterilized as follows: 30 minutes in 20% commercial bleaching liquid (with 10% NaCIO) with Tween 20 and three times rinsing with sterile tap water for a total of thirty minutes. A magnetic stirrer was used during this procedure. Then a few of the outer leaves were removed in a laminar air-flow cabinet; subsequently the shoot tips were sterilized again (20 minutes in 10% bleach, followed by rinsing with sterilized tap water). Subsequently basal ends of the shoot tips were cut off and then shoot tips were isolated in vitro.

Establishment of shoot tips (2–5 mm) took place on the following culture medium: MS microsalts (Murashige and Skoog, 1962) at half strength, MS macrosalts at full strength (except Fe), NaFeEDTA 25 mg/l, sucrose 3%, citric acid 150 mg/l (to decrease enzymatic browning), meso-inositol 100 mg/l, nicotinic acid 5 mg/l, vitamin B_1 5 mg/l, pyridoxim 0.5 mg/l, glycine 4 mg/l, BA 0.01 mg/l, NAA 0.1 mg/l, Difco Bacto agar 0.8% and pH 6.0 before autoclaving.

Subculture of shoots (two shoots per flask) took place in liquid media in Erlenmeyer flasks of 100 ml filled with 30 ml culture medium; placed on an orchid wheel at an angle of 45° at three rotations per minute; the same basic culture medium was used, except that agar was omitted and the regulators were changed as follows: BA 0.1 mg/l and NAA 0.001 mg/l.

Root formation of excised shoots took place on the same solid medium as described for isolation, except that the cytokinin BA was omitted and the auxin NAA was added at a concentration of 0.1 mg/l. In vitro-rooted plants were transferred to a greenhouse and grown until flowering. All cultures were kept in a culture room at 25°C and illuminated with Philips fluorescent tubes (TL 40 W/57, 6-8 Wm^{-2}); day length was 16 hrs. Experiments on axillary branching lasted 12 weeks, whereas rooting experiments were stopped after 6 weeks.

Results. Despite precautions and rigorous sterilization of the plant material, 40% was lost because of infection. After isolation about 75% of the shoot tips grew out into shoots. Sixteen sterile shoots were obtained on agar-solidified media to start the subculture on liquid media. Subculture on these media was started on a relatively low BA level of 0.01 mg/l; this was done to avoid callus formation and/or adventitious bud formation, which are induced by high BA levels and often lead to mutations in Bromeliaceae when propagated in vitro (Pierik, 1987). During the first subcultures in liquid media, axillary branching was slow, but gradually increased to a multiplication rate of 8–10 after 12 weeks of culture. A comparison between kinetin and BA showed that kinetin was not very effective in inducing axillary branching in *Aechmea fulgens*.

Subsequent experiments were continued with BA at three levels: 0.05; 0.1 and 0.2 mg/l; this experiment showed that a BA concentration of 0.05 mg/l was too low (fig. 10), whereas a concentration of 0.2 mg/l was too high for axillary branching. A BA/NAA ratio of 0.08/0.003 mg/l was the optimum (fig. 10 and 11).

Rooting of excised shoots on solid media was examined by varying the NAA concentration. NAA was chosen, since it was shown that this auxin had the greatest effect on rooting of Bromeliaceae (Davidson and Donnan, 1977; Hosoki and Asahira, 1980). The test results were:

NAA concentrations mg/l	0.00	0.01	0.10	0.30	0.50	0.80	1.00
No. of roots formed after 6 weeks	2.90	3.50	7.80	9.60	10.20	1.60	1.60

It became quite clear that NAA at 0.8 - 1.0 mg/l is too high for rooting. Normal roots (no callus and thickening) and a rather high number of root primordia were obtained at an NAA concentration of 0.1 mg/l (fig. 12). The plants obtained (fig. 9) were uniform, also in the flowering stage.

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Pierik, R.L.M. In vitro culture of higher plants. Dordrecht, The Netherlands: Martinus Nijhoff Publishers; 1987.

*Department of Horticulture, Agricultural University, P.O. Box 30, 6700 AA, Wageningen, The Netherlands.

Bromeliads "Blacklisted"

Geoff Lawn

No foliage bromeliad is truly devoid of colour, or black, but some come close since they have predominant or solid shades of indigo, mahogany, and aubergine purple, to deepest ebony. These dark beauties can be loosely grouped as those with rather fixed pigmentation and others of very variable leaf hues. Anthocyanic pigments,[1] which mask the green undertone and serve several purposes, produce this foliar attractiveness.

Anthocyanin-laden epidermal cells can shield deeper leaf tissues from intense ultraviolet light, which might otherwise destroy the photosynthesising chloroplasts. This function applies especially to sun-exposed, sparsely-scurfed species in the thinner atmosphere at high altitudes, particularly if stressed through moisture and nutrient deficiencies. Nearer sea level, growers can still achieve comparable results, even if seasonal, but low humidity and bleaching are dangers to watch. Become aware which green species and hybrids never redden up in your area but burn readily if subjected to strong light of long duration.

Leathery-leaved bromeliads of this category are named below.[2] They are usually reliable, but the reader should realise that hard-grown specimens at maturity are usually smaller than their well-fed, but less colourful counterparts:

Author

Fig. 13. ×*Nidumea* 'Midnight', a DeLeon cultivar.

Author

Fig. 14
Aechmea Black Panther, a Hummel hybrid.

• *Aechmea fasciata* var. *purpurea; A.* Black Magic, *A.* Burgundy; *A.* 'Black Marble', *A.* 'Noir', *A.* 'Very Black'.

• *Billbergia* Clyde Wasley, *B.* Othello, *B.* Penumbra.

• *Cryptanthus* Black Cherry, *C.* Black Mystic, *C.* Black Prince, *C.* Cherry Frost, *C.* Snakeskin.

• *Dyckia* Dark Chocolate.

• *Neoregelia fosteriana, N. johannis* "Rubra" (in hort.), *N. melanodonta; N.* Claret, *N.* Dark Delight, *N.* Deep Purple, *N.* Dexter's Pride, *N.* Morris Henry Hobbs, *N.* Royal Flush, *N.* Sanguine Night, *N.* Vulkan; *N.* 'Alvin Purple', *N.* 'Blackie', *N.* 'Darkie'.

• Bigenerics: ×*Cryptbergia* 'Red Burst'; ×*Neolarium* 'Thor', ×*Neomea* Black Snow, ×*Neomea* Magenta Star.

A race apart are the shade-loving *Aechmea* species whose soft, bicoloured foliage, it is theorised, enhances photosynthesis at lower light levels through the reflective properties of their anthocyanins. The red reverses of *Aechmea victoriana* var. *discolor, A. fulgens* var. *discolor,* and *A. miniata* var. *discolor* impart completely maroon- or garnet-colored leaves to many hybrids, often by the

champion specialist breeder Ed Hummel. Excessive light often dulls and muddies the natural foliage sheen and colouring in this group:

Aechmea Belizia, *A.* Black Flamingo, *A.* Black Knight, *A.* Black Panther (fig. 14), *A.* Black Prince, *A.* Black Tiger, *A.* By Golly, *A.* Chocolate Soldier, *A.* Ebony Glow, *A.* Foster's Favorite, *A.* Grape, *A.* Jackson, *A.* Lullaby, *A.* Mirlo, *A.* Nightlight, *A.* Nigre, *A.* Perez, *A.* Pico, *A.* Tonado, *A.* 'Black Jack', *A.* 'Prieto'.

In other genera, there are *Vriesea sucrei, Nidularium billbergioides* Rubra, *N. innocentii* Nana, *N. microps* var. *bicense;* ×*Nidumea* Jean, ×*Nidumea* 'Midnight' (fig. 13).

Some growers complain that the appearance of these dark-leaved plants is lifeless either en masse or singly and, indeed, they can look somber when shown this way. As companion plants in a mixed display, however, they provide contrast and solidarity to plants with lighter patterned foliage, notably variegates.

For competition and displays, the shiny-leaved specimens especially should be wiped clean as they invariably show up any mineral deposits, grime, or dust. In artistic arrangements requiring dramatic or bold simplicity, blackish rosettes or leaves can evoke themes of evil and mysticism.

This favourable "black list" is by no means complete but it focuses on a multitude which, often possessing long-lasting, attractive inflorescences too, vie for a plum role, figuratively speaking, in our collections.

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Benzing, D.H. The biology of the bromeliads. Eureka, CA: Mad River Press; c1980.

Butcher, D.R., comp. Hybridist's handbook and checklist of bromeliad hybrids and cultivars. 2nd ed. [Adelaide, S.A.] The Bromeliad Society of South Australia; 1986.

Smith, B., comp. Manuscript of bromeliad hybrids and cultivars. 2nd ed. Plano, TX; 1984.

NOTES:

1. Anthocyanic pigments are those that give red and blue flowers their colors.

2. *Editor's note: In every case where I could find names specifically identified as cultivars you will find single quotes. Names without quotation marks are collective epithets denoting hybrids. If you have proof to the contrary, both Don Beadle (see address as Cultivar Registrar in the directory inside the back cover) and I would be grateful for the information.*

3. A slightly different version of this article was published in the Bromeliad Society of New South Wales Bromeliad Newsletter, Feb. 1988.

Como, Perth, Western Australia

Rare Bromeliads from Brazil, No. 3: *Lymania Corallina*

Gustavo Martinelli and Elton M.C. Leme

Some Brazilian herbaria, especially those of the Rio de Janeiro Botanical Garden and the Cocoa Research Center (Centro de Pesquisas do Cacau -CEPLAC), have in their collections of dried plants specimens of peculiar bromeliads generally identified as *Aechmea brachycaulis* Morren ex Baker. Yet, a slight examination of these exsiccates has revealed the presence of discordant morphological elements in each of them that show how risky is identification on the basis of the keys and studies then available.

With the publication of Dr. Robert W. Read's research that resulted in the creation of the genus *Lymania*[1] new light was shed on the complex of species imperfectly identified as *A. brachycaulis.* The confusion being straightened out, it became easy to identify clearly those species as *L. alvimii* (L.B. Smith & R.W. Read) R.W.Read, *L. smithii* R.W. Read, and *L. corallina* (Brongniart ex Beer) R.W. Read.

As such identifications are being made, different data and information are being gathered. These allow a better understanding of the ecological preferences and the geographical distribution of these species. On the other hand, the genus *Lymania* is still a quite new item in the list of cultivated bromeliads in the United States as well as in other countries. Among the most common species found in cultivation, the outstanding are *L. alvimii* and *L. smithii.* As for *L. marantoides* (L.B. Smith) R.W. Read, we can tell with certainty that the species is practically nonexistent in collections. The same can be said of *L. corallina.*

Some specimens, however, picked up in Bahia state by G. Martinelli were grown in Rio de Janeiro by E.M.C. Leme. As they bloomed, it was revealed that they belonged to *Lymania corallina.* All indications point to the fact that *L. corallina* is one of the most ornamental of all of the representatives of the genus, not only for the different colors of their leaves, which can be green or wine-colored, but for the remarkable coral color of its inflorescence. Such characteristics were faithfully reproduced in the precise art of Edouard Morren and are presented here in more detail:

***Lymania corallina* (Brong. ex Beer) R.W. Read**

Plant propagating by elongate, slender stolons. *Leaves* about 7, 25–50 cm long, suberect or recurved toward apex, the outer much reduced, forming a spindle-shaped or ampullate reservoir at base. *Sheaths* elliptic, 8–11 cm long, 4–5 cm wide, light brown-lepidote on both sides, greenish inside, burgundy-red or green outside. *Blades* long lanceolate, 28–39 cm long, 1.5–2.5 cm wide tapering

Fig. 15

photos by E.M.C. Leme

Fig. 16

Two forms of the species *Lymania corallina*, "Wine" (fig. 15) and "Green" (fig. 16). The green form was illustrated in volume 34, page 214 as a color drawing M.B. Foster made in the field.

toward the base, narrowly canaliculate, apex acute and epiculate or broadly acuminate, green and glabrous above, green or burgundy-red and inconspicuously lepidote beneath, margins entire or obscurely serrulate. *Scape* about 15 cm long, about 3 mm in diameter, pale red, slightly exceeding the leaf-sheaths. *Scape bracts* linear-lanceolate, tenuously acuminate, pale red but soon drying, membranaceous, about 5 cm long, about 7 mm wide, slightly nervate, inconspicuously lepidote, entire, exceeding the internodes. *Inflorescence* bipinnate at base, about 5 cm long, subdense, congested in the throat of the vase. *Primary bracts* like the scape bracts but smaller, reflexed at anthesis. *Rachis* geniculate, inconspicuously white-lepidote. *Branches* pedunculate, 3–4 cm long, with 3–4 flowers. *Floral bracts* inconspicuous, about 1 mm long, filiform. *Flowers* sessile, polystichous, 25 mm long. *Sepals* suboblong, asymmetric, about 8 mm long, fused at base for about 4 mm, with membranaceous margins near the apex, thickened at base and bearing 2 longitudinal keels prolonged on the ovary, apex obtuse-cucullate and unarmed, red, glabrous. *Petals* subspathulate, apex subacute, about 15 mm long, more or less aglutinate at base for 5 mm, white, with 2 well developed longitudinal calli up to 8 mm above the base. *Stamens* included. *Filaments* flat and becoming broader toward apex, epipetalous about 8 mm adnate to the petals, the other one 5 mm adnate to the petals. *Anthers* sublinear, about 4 mm long, base obtuse and apex apiculate, fixed near the middle. *Ovary* 5 mm long, conspicuously 6 alate-carinate, glabrous, red. *Epigynous tube* inconspicuous. *Placenta* apical. *Ovules* caudate.

Material examined: Brazil: Bahia State, County of Uruçuca (applies throughout), G. Martinelli 6059, July 26, 1979 (RB); Ubaitaba to Porto Santo Antonio, T.B. Santos 2337, June 23, 1972 (RB, CEPEC); Itabuna, G. Martinelli 7683, Sept. 14, 1981 (RB); Itacare, T.B. Santos 1754, July 13, 1971 (RB); Taboquinhas to Uruçuca, T.B. Santos 1768, July 15, 1971 (RB); Uruçuca to Serra Grande, L. Mautone 963 et al. July 26, 1979 (RB).

Lymania corallina can be found in the southern Bahia rain forest that grows on the mountains along the sea, generally called the Atlantic Forest. As an epiphyte, this gracious bromeliad develops through long and slender stolons on trees and bushes in the lower stratum of the forest. In this part of the woods the microclimate is marked by dense shade and intense dampness. The dampness is maintained by the heavy rains (annual average about 1100–2000 mm). Other factors such as the annual temperature of 24 degrees C, the low elevation, and the proximity of the Atlantic Ocean are also important.

Cultivation of *Lymania corallina*, as well as the other species of this genus, has not presented serious difficulties in Rio de Janeiro since its reproduction is easy. But, to imitate nature and to provide a better rooting and better fixing for the new bud that will grow, we are in the habit of introducing tree fern fiber in one piece (35 cm long and 5 cm in diameter) vertically in a 20-cm pot, fixing it in position with common substratum for growing epiphytes. The specimens are

planted near the base of the tree fern and to the new bud will be left the task of finding its vertical way. That will happen in a very short time.

Herbarium Bradeanum
Rio de Janeiro Botanical Garden

NOTES:

1. J. Brom. Soc. 34: 119-121, 212-216; 1984.

Book Reviews *[continued from page 209]*

How did they ever get 275 plant names plus 10 black and white drawings and a map in 30 pages? By plain hard work and the good sense to code the information:

Species	Alt. Range	Growth	Conditions
argentina	450–1300 (m?)	E.S.	B, FD, H
albertiana		E.S.	B, D, H
etc.			

Meaning: E–epiphyte; S–saxicolous; B–bright; FD–fairly dry; H–humid.

There are in addition, a key for abbreviations used, a general description, and a discussion about how to grow tillandsias, all in four pages.

They didn't fool around. Well done. Recommended.

The Garden Watcher, by May A. Moir. Rev. ed. 1989. 136 p., color and b&w illus.; 23 cm. Published for the Harold L. Lyon Arboretum. $14.95 + $1.00 postage, 50¢ each additional book. Paperback. Univ. of Hawaii Press, Order Dept., 2840 Kolowalu St., Honolulu, HI 96822.

To quote shamelessly from the Press blurb: "For over thirty years one of Honolulu's foremost gardeners kept a diary of the blooming, fruiting or seeding, color changes, and the falling of leaves of the special plants in her gardens. The result of May Moir's observations is this charming combination of fact and opinion. Each of the twelve monthly chapters ends with a recipe of seasonal ingredients." Since printing a notice of the first edition in 1984 (34:181), the *Journal* has provided readers with 20 bromeliad arrangements by Mrs. Moir. This revised edition contains many of them, illustrated in color, with many more illustrations, and an index.

While Mrs. Moir did her watching in Honolulu, her words are instructive to just about anybody. This is a pleasant way to learn about plants, including bromeliads, and a quick reference for what's blooming when (Antipodes might want to reverse the seasons). Highly recommended especially for struggling bromeliad arrangers as well as for other bromeliad hobbyists. The index omits orchids and bromeliads–probably ran out of space.

Bromeliaceae, Subfamily Tillandsioideae. Flora of the Guianas. Series A: **Phanerogams,** fascicle 189 by Eric J. Gouda. 112 p. including 8 as colored plates; 7 black and white drawings, map; 23 cm, soft cover; 1987. Order from the publisher: Koeltz Scientific Books, D 6240 Koenigstein, P.O. Box 1360, West Germany. DM 60.

Dr. Gouda has described in this part of the Flora of the Guianas two species of *Catopsis,* 10 of *Guzmania,* 23 of *Tillandsia,* and 14 of *Vriesea,* some with one or more varieties. He has followed Dr. Lyman B. Smith's system and provided keys to the species calling out those listed in this work. His descriptions were made using collections of the Guianas and surrounding areas supplemented with other material where native collections were few. In addition to his highly detailed descriptions, the author has included distribution lists, vernacular names, and in most cases, short statements on culture and use.

Twenty-five species are illustrated in color and five in black and white. The drawings, by the author, are especially well done. With one exception they will be new to readers familiar with the Smith and Downs monograph.

Dr. Gouda has summarized old and recent information about the history of these plants. He has made four new combinations, placed six names in synonymy, and resurrected one, *Guzmania altsonii.* In acknowledging the difficulty of distinguishing between some *Tillandsia* and *Vriesea* species he has declined to put them into one genus, "because the Tillandsia-Vriesea group is rather heterogeneous...and more study of (fresh) flower material is needed to distinguish more natural groups."

Essential for the botany collections of academic libraries, botanical gardens, and for advanced collectors; recommended because of the notes on culture and use for bromeliad society libraries.

Includes: list of collections studied, indexes, and bibliography.

Flora Novo-Galiciana; a descriptive account of the vascular plants of western Mexico. Volume 15: Bromeliaceae to Dioscoreaceae by Rogers McVaugh. 398 p., 62 figures, 3 colored plates including frontispiece, maps; 26 cm, cased; April 1989. Pages 4–79 are given to Bromeliaceae and the remaining pages to 11 other plant families, all presented in the same manner with, as the publisher states, keys to genera and species, descriptions of families, genera, and species, notes on habitats and distributions, and citations of representative specimens. Order from: Flora Novo-Galiciana, Univ. of Michigan Herbarium, N. University Bldg., Ann Arbor, MI 94109-1057. U.S. orders for vol. 15, $56.00; non-U.S. orders, $58.00. Prices include postpaid shipment.

Nuevo Galicia is the area of western Mexico that includes all the states of Jalisco, Colima, and Aguascalientes, and portions of adjacent states. A summary of the bromeliads of the coast of Jalisco by Patricia Magaña Rueda was printed in this journal in the May-June 1987 issue. Dr. McVaugh's area of interest is much

greater, consequently he names and describes many more plants: *Aechmea*—4, *Billbergia*—1, *Bromelia*—4, *Catopsis*—3, *Hechtia*—6, *Pitcairnia*—14, *Tillandsia*—35.

One new species *(Pitcairnia compostelae)* is described, but unfortunately not illustrated, and three tillandsias published since 1977 are included. The author acknowledges the work and guidance of Dr. Lyman B. Smith whose descriptions provided the models for many of those in this flora. In addition to the historical citations and the descriptions, Dr. McVaugh has added notes, comparisions, discussions to clarify matters such as: "...*H[echtia] laevis* is essentially indistinguishable from *H. reticulata.*" His "Doubtful and excluded species" with descriptions and discussions of problems and recommendations for further study are especially valuable.

The illustrations are of exceptional quality. Some discussions and recommended name changes made since 1987 have not been included, but every author must accept deadlines.

The further extent of Flora Novo-Galiciana is beyond the scope of this review. This portion is certainly worthy of the attention of all interested in the study of Bromeliaceae. Academic and botanical garden libraries will be certain to have this title on standing order. Includes index.

Dr. R.W. Read Retires

Robert W. Read, curator of botany at the United States National Herbarium (US), Dept. of Botany, the Smithsonian Institution, has retired after 22 years of service, 16 in the grade of curator. He plans to continue his research on palms and bromeliads in association with The Fairchild Tropical Gardens and The Marie Selby Botanical Garden, respectively. His bromeliad research interests include *Pitcairnia* in the West Indies and members of the subfamily Bromelioideae. Dr. and Mrs. Read's new address is 258 Rose Apple Lane, Naples, FL 33961, telephone: 813-793-1074.

ATTENTION AFFILIATED SOCIETIES EDITORS. Mary Jane Lincoln is the new Affiliated Societies chairperson. She requests that you send her copies of your newsletters for use in preparing an *Affiliates Newsletter* to:

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Affiliated Societies Committee Chairperson
1201 Waltham Street
Metairie, Louisiana 70001

Regional Reflections

The Case for the Tillandsia, An Appraisal

Jack Percival

Devotees of the low-slung neoregelia, the prickly aechmea and the frail guzmania to name but a few, no doubt will reach for their six-shooters and prepare for the battle which this dissertation is bound to inflame. First a confession: this columnist carries an addiction not unlike the heavy smoker or the alcohol abuser: it won't quit! The malady to which I refer is the unashamed worship of the mighty **tillandsia.** Every writer, every low-paid columnist has the journalistic right to express his own private, biased opinion when he so labels it—and that, dear reader, is what my intention is herewith. At the moment, I command your attention and your thoughts. At a later time, your turn will come.

And now to the facts of my defense that the tillandsia is the **King** among all bromeliads. My argument is strenghtened by simple comparisons of the King and a few of the popular rival genera.

Firstly, let us bring to the arena the neoregelia. Granted, this plant has interesting leaf coloration if one is in the position of viewing it solely from above. However, even its most avid admirers will admit that the neoregelia at times spews forth some formidable fumes closely resembling rotten eggs. In fact, it is rare that one will observe an admirer bending down low over the center of this plant. From his own experience, he knows it is wiser to do any viewing from a safe distance. Besides this, the neoregelia produces flowers that can be seen only by those of us who wear bifocals. Admirers who do see the blooms are not known to sing any loud praises of the colors of the little flowers. An annoyance because of its vase shape, the plant is paradise for the mosquito, the snail, the worm, the frog and old rotten leaves. The **King** is not guilty of any of these negatives.

Next comes to mind the aechmea. Here we have a plant that can inundate a modest garden before the innocent grower realizes it. This giant of the family is so tough that it usually can withstand the grinding teeth of the local bug population but seems to be unable to resist scale. With its sharp spines, aechmea closely reminds one of the beautiful, shapely twenty-year old chick—look at the body but don't touch! Not only does this hefty creature have spines on its leaves from stem to tip, it further protects itself by exhibiting barbs on its berries. The observer in this case keeps his distance. Some who have not done so have ended up with infected hands and arms. Many of us hobbyists have permanent scarring to prove we have been too close to this plant. The **King** displays no such armor.

The guzmania is our third and final candidate. This frail bromeliad shows some fine colorations on leaves that are brittle and easily creased or broken.

It seems to be a target for the insects of the forest, garden and greenhouse. The delicate leaves often become victims of high winds. In general it is a very tender personality and is not an easy plant to cultivate. While not a complete weakling, it comes close to being one. The **King** shows no such weak tendencies.

Lastly we turn to the **King** himself. Is the tillandsia really the **King**? That it rules supreme is possibly an overstatement. To some, this is dubbed an exaggeration. To others, the title of king rightly goes to the exciting tillandsia.

In defensive summation, merely a closing broad question: in the whole bromeliad family is there any that can compare favorably with the **King**? Specifically, in its:

1. many variations of body shape and form?
2. countless different types of leaf formation?
3. absence of debris and odor?
4. ability to be insect-free? (with the exception of the ant-tillandsia coexistence for the equal benefit to each)
5. freedom from sharp spines?
6. adaptability to all climes?
7. Trichome (foliar hair or scales) capability: that is, its elasticity to open the scale to catch the rain or moisture and to close it in times of drought?
8. versatility to prosper on almost any medium?

Thus—the case is closed for the tillandsia. Biased account? Of course. Controversial? Correct. However, there is a bright side of this one-sided thesis: to the diehards, those lovers of the neoregelia, the aechmea, and the guzmania (and in fact any other genus), we extend our friendly hand and offer equal time for your rebuttals. . . Is the tillandsia really the **King**? What are your thoughts?

Reprinted from the San Diego Bromeliad Society **Newsletter,** *June 1989*

Tillandsia Tips

Bea Hanson

Here are a few tips on growing tillandsias that were gleaned from here and there.

(a) Don't mount a blooming plant. Cut off the bloom spike or mount before one appears. When a bromeliad comes into bloom its roots cease to grow and the declining plant's remaining vigor is confined to producing seed and offsets. Logical when you come to think of it.

(b) Select young plants with root growth in progress. This will give quicker results but any plant that is going to root anyway will do so with good air

circulation, good light and a good watering and fertiliser programme.

(c) Beware of any treated wood. This is a killer. Salt water driftwood seems to have no adverse affects but wash well with clear water just to be on the safe side. I leave mine out in the rain until it is time to use it, then bring it in and let it dry.

(d) If there are roots on the plant turn the roots toward the mount and glue or staple on. Glue does not damage the roots. If you happen to have a glue gun and are using 'hot glue', if it burns your finger it will also burn the plant's little bottom.

(e) Always be sure plants are firmly on wood etc. If they move about roots take a lot longer to appear.

(f) If you are not keen on using glue you can bore two small holes and thread thin plastic-coated wire (not copper) through, place plant inside the loop and fasten tightly at the back of the mount. For some heavier tillandsias I have used both glue and the wire to be sure they are firm.

(g) Change positions of your tillandsias by all means but when you have the ideal one do leave the plant there. If you keep changing them about the poor things begin to wonder what they should do next.

(h) Speaking from experience. When you at last manage to get a small clump of tillandsias don't let people try and get pieces off you. I did that years ago and now realise if I had been firm I would have had some really super clumps today!

Reprinted from the Bromeliad Society of New Zealand Bulletin, *February 1989*

HERE IS AN EXAMPLE of how the routine can be made attractive to both regular and prospective members. The *Hawaii Bromeliad Society Newsletter* for January 1989 reports:

> At each HBS meeting we have "Show and Tell" where any member may bring in a prize bloom and brag about it; "General Hospital" where ailing plants may receive a diagnosis from some of our experts; "What's My Name" where blooming or mature plants may hope to receive a name tag; "The Seed Bank" where any member may receive seeds to try; and "The Blooming Book." our HBS list of what blooms when. These features form our School of Bromeliad Culture and are the reason many join our society.

Questions & Answers
Conducted by Kathy Dorr

All readers are invited to send their questions and observations about growing bromeliads as a hobby to the editor. Answers will be sent directly to you and some questions will be published.

Q. I would like something that has colorful foliage that I can grow as a houseplant in a brightly lighted window. What do you recommend?

A. *Billbergia* Fantasia, *B. chlorosticta, B.* Fascinator, *Aechmea orlandiana, Vriesea splendens, Guzmania zahnii* and *Vriesea hieroglyphica* would all be excellent plants for your purpose.

Q. Is there any way to clean clay pots and keep them clean—referring to the "salts" that collect on the pot?

A. Yes, you can soak them in a solution of Clorox and water [1 part bleach and 9 parts water] for several days and then wash them thoroughly. After washing, you can rub the outside of the pot with a vegetable oil and it will at least slow down the accumulation.

Q. I have noted there are two plants of quite different size both with the name *Cryptanthus lacerdae*. The smallest one seems quite difficult to grow and the larger one seems quite hardy. Are these actually the same plant?

A. In *The Bromeliad Society Bulletin*, vol. 9, pages 46-47, Mulford Foster states that *Cryptanthus lacerdae* is one of the smallest of the cryptanthus. Further that, through a secondary cross, he had produced an exact duplicate that was much larger. This would indicate that the small plant you refer to is the species and the larger one is actually a *Cryptanthus lacerdae* hybrid. It was probably so designated in the beginning, but somewhere along the way through the years this designation was deleted.

Q. Some of the bromeliads I have been growing in the yard have developed spots causing them to look as though they are diseased. This has only occured in one area—under the power pole and lines. Could they be a contributing factor?

A. Definitely yes. Most wooden power (and telephone) poles have been creosoted and/or treated to prevent rotting. When it rains, or you water, or even with dew dropping on the plants, it will cause damage. Unless you can convince the power company to go underground, this area will continue to be off limits for bromeliads.

THE BROMELIAD SOCIETY, INCORPORATED
MINUTES OF THE ANNUAL GENERAL MEETING
Los Angeles, California, 20 May 1989

The president called the meeting to order at 9 A.M. The meeting was adjourned at 9:03 A.M. for lack of a quorum.

DIGEST OF THE MINUTES OF THE ANNUAL MEETING
OF THE BROMELIAD SOCIETY, INC.
BOARD OF DIRECTORS
Los Angeles, California, 20 May 1989

Officers and directors present:

Don Beadle
Harvey R. Bullis, Jr.
William E. Frazel
Jack Burton Grubb
Linda Harbert
Odean Head
Paul T. Isley, III
Clyde Jackson
Thomas U. Lineham, Jr.
Stan Oleson
Polly Pascal
Gerald A. Raack
Gregory A. Reid
Charlien Rose
William A. Soerries
Valerie L. Steckler
Bob D. Whitman

Eight directors were absent.

New directors: California Region. Paul T. Isley III was elected to fill the vacancy for the remainder of the 1989-1991 term. Western Region. Mark A. Dimmitt was elected to fill the vacancy created by Robert E. Soppe's resignation (1988-1990 term).

Minutes: The minutes of the annual meeting held in Miami, 18-19 May 1988 were approved.

Reports were accepted from all of the officers and chairmen of standing and special committees except that there were no reports from the Audit and Research Grants Committee chairmen and the Slide Librarian.

Election results: Please see Directory, inside back cover, this issue.

Treasurer: The financial report for 1988 and budgets for 1989 and 1990 appear as addenda 1 and 2.

Editor: The past and current editors were authorized to set reduced prices for excess copies of the *Journal* and to advertise their availability for sale to affiliates (for library and recruiting purposes).

Judges Handbook Committee: Mrs. Valerie Steckler is preparing a report of the cost of the second edition of the *Handbook* for distribution to Board members.

World Bromeliad Conference matters:

a. Future auctions will include items to benefit the BSI or BIC as specified by the donors.

b. Advertising and information. The schedule for publishing Houston 1990 WBC material in the *Journal* and payment of costs were approved. Future publication will be free provided that the host society donates $10.00 per registrant to the BSI as long as the conference is profitable.

c. The Houston 1990 WBC officers agreed to provide a booth for BSI use.

d. The president will appoint a committee to recommend future relationships between the society and affiliates on WBC matters.

Other matters:

a. The death of Honorary Trustee Robert G. Wilson of Costa Rica was noted with regret. Mr. Isley recommended that Board members support action to match a N.S.F. grant of $150,000 to support the Wilson's botanical garden "Las Cruces."

b. The Board instructed the president and the chairman of the Conservation Committee to inform all appropriate government officials of the position of the society on CITES matters.

c. The membership secretary's proposal to publish the 1989 *Membership Directory* was approved. Advertising to appear in the *Directory* will be solicited.

ADDENDUM #1A: BALANCE SHEETS (not audited)
DECEMBER 31, 1987 (ACTUAL) AND DECEMBER 31, 1988 (INTERIM)

CURRENT ASSETS	1987	1988
Cash in Bank - Texas Commerce Bank #09-601908	$ 8,426.22	
First Commerce Bank #02-0072-7	1,963.63	
Coast Savings & Loan		$ 12,038.11
	$ 10,389.85	$ 12,038.11
Dean Witter - Bromeliad Identification Account #015893649	$ 9,969.41	$ 9,165.78
General Account #015860686	52,855.87	36,170.46
Life Membership Account #015893630	8,559.11	9,186.04
	$ 71,384.39	$ 54,522.28
Advances - Corresponding Secretary:	$ 200.00	
Editor	500.00	350.00
Judges Certification	200.00	200.00
Membership Promotion	100.00	100.00
Slide Library	375.00	375.00
Affiliates Newsletter	100.00	84.29
Publications	100.00	100.00
Seed Fund	200.00	200.00
	$ 1,775.00	$ 1,409.39
LOAN RECEIVABLE - BSSF WORLD CONFERENCE		$ 1,000.00
FIXED ASSETS		
Library & Equipment	$ 4,348.39	$ 4,348.39
Less: Accumulated Depreciation	(1,621.08)	(2,089.54)
	$ 2,727.31	$ 2,258.85
Inventory	$ 53,988.28	$ 53,988.28
Stock - 2 Shares UNISYS, Inc.	200.00	200.00
TOTAL ASSETS	$ 140,464.83	$ 125,416.91
NET WORTH	$ 140,464.83	$ 125,416.91

ADDENDUM #1B: PROFIT AND LOSS STATEMENT (not audited)
FOR THE YEARS ENDED DECEMBER 31, 1987 (ACTUAL) AND DECEMBER 31, 1988 (INTERIM)

GROSS RECEIPTS	1987	1988
Advertising	$ 6,098.30	$ 5,307.82
Back Issues	1,393.50	1,567.22
Book, Binders & Other Publications	7,198.77	5,221.03
Bromeliad Identification	120.00	573.00
Buyers' Guide		250.00
Color Plates and Separations	1,349.00	1,297.18
Cultural Sheets	414.75	325.80
Dividends	5.36	5.76
Interest	5,330.25	5,418.63
Judges Certificates	65.00	230.00
Medallions/Trophies	1,451.77	1,112.19
Memberships	36,161.09	32,205.90
Padilla Research Fund	298.00	200.00
Postage	88.17	87.01
Seed Fund	818.09	854.62
	$ 60,792.05	$ 54,656.16

EXPENSES	1987	1988
Affiliates Newsletter	$ 268.58	$ 169.17
Bank Charges	51.00	137.23
Books, Binders & Other Publications	4,613.98	724.73
Bromeliad Identification Center	3,010.00	1,486.00
Cultural Sheets	365.00	989.50
Depreciation	507.78	468.46
Director/BSI Meetings	613.86	395.30
Dues	15.00	
Grants	1,095.00	420.00
Hybrid Registrar	22.00	
Journal		
- Printing & Photos	21,970.09	33,583.53
- Mail Service & Postage	7,546.91	5,831.63
- Typesetting	5,939.88	7,191.97
- Editor Vehicle Allowance	1,800.00	1,800.00
	$ 38,959.84	$ 50,374.77
Judges Chairman	$ 5,325.02	$ 2,588.93
Office & Stationery		140.24
Medallions/Trophies	1,231.22	2,495.95
Membership- Contract	5,400.00	4,950.00
- General Expenses	1,311.65	1,776.21
- Directory	2,059.50	
	$ 8,771.15	$ 6,726.21
Parliamentarian	$ 2,040.00	$ 982.00
Postage	135.56	94.40
President's Expense		572.81
Secretarial	156.81	
Seed Fund	823.17	787.51
Slide Chairman	200.20	
Taxes - Franchise Tax	45.00	10.00
Treasurer's Expense		140.87
	$ 68,250.17	$ 69,704.08
NET LOSS	(7,458.12)	(15,047.92)
NET WORTH - BEGINNING OF YEAR	147,922.95	140,464.83
NET WORTH - END OF YEAR	$ 140,464.83	$ 125,416.91

ADDENDUM #2: APPROVED BUDGETS
FOR THE YEARS ENDED DECEMBER 31, 1989 AND DECEMBER 31, 1990

GROSS RECEIPTS	1989	1990
Advertising	$ 5,000.00	$ 5,000.00
Back Issues	2,000.00	2,000.00
Books, Binders & Other Publications	5,500.00	5,500.00
Bromeliad Identification	500.00	500.00
Color Plates and Separations	1,300.00	1,300.00
Cultural Sheets	400.00	400.00
Dividends	6.00	6.00
Interest	5,500.00	6,000.00
Judges Certificates	100.00	100.00
Medallions/Trophies	1,200.00	1,200.00
Memberships	42,000.00	38,000.00
Padilla Research Fund	200.00	200.00
Postage	100.00	100.00
Seed Fund	900.00	900.00
	$ 64,706.00	$ 61,206.00

EXPENSES	1989	1990
Affiliates Newsletter	$ 100.00	$ 100.00
Bank Charges	100.00	100.00
Books, Binders & Other Publications	800.00	800.00
Cultural Sheets		1,000.00
Depreciation	456.00	456.00
Director/BSI Meetings	400.00	400.00
Grants	200.00	200.00
Journal		
- Printing & Photos	19,000.00	21,000.00
- Mail Service & Postage	5,700.00	6,000.00
- Typesetting	7,200.00	7,600.00
- Editor General Expenses	1,600.00	1,750.00
- Editor Vehicle Allowance	1,800.00	1,800.00
	$ 35,300.00	$ 38,150.00
Judges Chairman	$ 200.00	$ 200.00
Office & Stationery		200.00
Medallions/Trophies	2,500.00	1,500.00
Membership- Contract	5,800.00	5,400.00
- General Expenses	1,800.00	1,800.00
- Biennial Directory	2,000.00	
	$ 9,650.00	$ 7,200.00
Postage	100.00	100.00
President's Expense	300.00	300.00
Seed Fund	800.00	800.00
Slide Chairman	590.00	490.00
Taxes - Franchise Tax	10.00	10.00
Treasurer's Expense	200.00	200.00
	$ 51,706.00	$ 9,000.00
RESERVES	$ 13,000.00	$ 9,000.00
Contingency	1,500.00	1,000.00
	$ 11,500.00	$ 8,000.00

BACK ISSUES OF THE *THE BROMELIAD SOCIETY BULLETIN,* volumes 1–8 (1951–1958) are available in limited quantities at $84.25 for all 8 or $12.55 each ppd. Separate issues vol. 1–8 only $2.25 ppd. Write or call the editor for details: 1508 Lake Shore Drive, Orlando, FL 32803 tel. 407-896-3722. –Ed.

The Bromeliad Society, Inc.

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

Calendar of Shows *(continued from back cover)*

7-8 October	Sarasota Bromeliad Society Annual Show and Sale. Selby Botanical Gardens, 811 South Palm Avenue, Sarasota, FL. Saturday, 10 A.M. to 5 P.M.; Sunday, 10 A.M. to 4 P.M. Admission to Gardens (and show) $4.00. Wally Berg 813-924-0060.
27-29 October	Southwest Bromeliad Guild 18th Annual Show and Sale, "Bromeliad Fest." Host: Greater Dallas-Fort Worth Bromeliad Society. Dallas Civic Garden Center, Fair Park, Dallas. Friday, 2 P.M. to 8 P.M. (Registration/show plant entry); Saturday, 10 A.M. to 5 P.M.; Sunday, noon to 5 P.M. Flo Adams 817-467-7500.
11-12 November	Caloosahatchee Bromeliad Society Standard Show and Sale, "Bromeliad Hoedown." Lee County Garden and Activities Center, Fort Myers, FL. Entries and judging, Friday 10 Nov., 10 A.M. to 12 noon. Show hours: Saturday, 9 A.M. to 6 P.M.; Sunday, 10 A.M. to 4 P.M. Betty Ann Prevatt, 813-334-0242.

H. Hemker

Tillandsia laui Matuda, Cactaceas y Suculentas Mexicanas 20:96-7. 1975.

This large, to 6 dm tall, epiphyte occurs in cool cloud forests in Oaxaca state, Mexico. It resembles *Tillandsia imperialis,* but according to its author, "it is much bigger, it has much longer leaves; its inflorescence is of a glaucous green color and the corola [sic] is large spathulate and of an ochreous yellow color."

This species is occasionally available in the trade but has little to recommend it. For collectors only.

Calendar of Shows

1-3 September	Florida State Bromeliad show, "Bromeliad Spectrum," sponsored by the Bromeliad Society of Central Florida and the Florida Council of Bromeliad Societies. Florida Mall, corner of S. Orange Blossom Tr. and Sandlake Rd., Orlando. Friday-Saturday, 10 A.M. to 9 P.M.; Sunday, noon to 5:30 P.M. Standard judged show. Entries received at 9:15 P.M. Thursday. Betsy McCrory, 407-348-2139.
22-23 September	Saddleback Valley Bromeliad Society Judged Show and Plant Sale. Hotel Meridien, 4500 MacArthur Blvd., Newport Beach, CA 92660. Saturday and Sunday, noon to 5 P.M. Grace Barnes, 714-581-7314.

(continued inside back cover)