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COVER PHOTOGRAPHS. Front: *Tillandsia weberi*, the new species from Jalisco, Mexico, named in honor of our late honorary trustee, Wilhelm Weber, is described on pages 105-107 and 131. Photograph by L. Hromadnik. Back: *Aechmea weilbachii* forma *viridisepala*. Please see pages 123-125. Photograph by E.M.C. Leme.

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For the Record: on M.B. Foster's Hybrids

Racine Foster

Bromeliad aficionados have approached me about Mulford Foster's hybrids. What are they? Thirty or forty years have passed since many of them were made, so I would like to explain the position of his originals.

His hybrids were made with pure, virgin species which had been collected recently in their native habitats of Brazil, Mexico, Venezuela, and Colombia. I must emphasize *species* many of which were *new* species that no man had ever pollinated before; no one had carried pollen from one of his new species to another of his new species. This was the advantage during those decades between 1940 and 1960. This meant that Mulford's originals were *clean* hybrids, resultant hybrids between pure species on pure species.

Within a year or two after Mulford's primary hybrids were made, it was easy to guess the identity of at least one parent because of some recognizable dominant characteristic, if you knew the parent species well.

Today, what passes as hybrids are too often offspring of interbreeding, or hybrids on hybrids of several watered-down generations. I am sure that Mulford

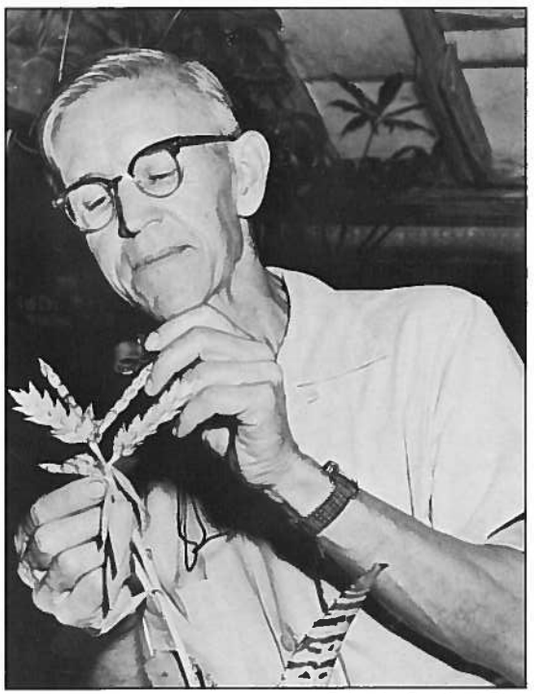


Fig. 1
Mulford B. Foster in his greenhouse, about 1956. The magnifying glass was a constant companion.

Orlando Sentinel Star

Al Muzzell

Fig. 2

Two of M.B. Foster's hybrids are described here for the first time by Mrs. Foster. Aechmea Miriam is a hybrid of *A. racinae* crossed with an unidentified form of *A. weilbachii.*

M.A. Spencer

Fig. 3

Aechmea Jeanne Eunice is the resultant of *A. blanchetiana* crossed with *A. fulgens.*

could not really foresee thirty years down the road when indiscriminate hybridization would produce offspring so diluted or mixed up that the distinctive determining characteristics for recognition of the original species involved were no longer there, least of all for the layman not versed in taxonomy.

How well I remember what it took to bring those baby bromeliad hybrids into being. Out of hundreds of flowers hand pollinated with a tiny artist's brush Mulford's results were 100% viable seed! They had been given the right medium, moisture, and light, so they all sprouted. The flats were a glorious mass of tiny green leaves. Each flat of seedlings was lovingly cared for and meticulously labelled. Every night with flashlight in hand, Mulford would search for tiny, but destructive, snails or worms that were as green as the leaves, impossible to see; only the flashing of the light made the worm move enough to be caught. Mulford dusted with Captan and put out snail bait, carefully covered the flats with screen and/or glass. Then a cold night would come along and kerosene stoves had to be used. If they were not carefully cleaned each night or if they were turned up too high, they produced an oily soot. Just try to get *that* off those delicate little leaves.

In 1953, Mulford was 65, an age when most men think in terms of retirement, a situation that didn't coincide with his prodigious energy and aggressive enthusiasm for building a new garden. To satisfy this reaching out for a new horizon and to get into the peaceful countryside, we bought the ten acres that became Bromel-La.

It was spring, so Mulford brought out from town many of his thousands of hybrid seedlings. Just a bunch of little green leaves in two-inch pots with little

Author

Fig. 4: Bromel-La was the Fosters' own botanical garden with bromeliads, cycads, palms, and a canopy of the native live oaks festooned with Spanish moss.

evidence of their promise. Each pot was carefully labelled in advance. They were placed in the right overhead shade, the right acid mulch at their feet, and perhaps, above all, the right air currents of this sloping, subtropical land. If bromeliads are happy, they proliferate. And, believe me, they were happy at Bromel-La. Those thousands of seedlings grew wild over the ten acres! Helped by the wind and rain they pushed out of their little pots, gloried in their freedom, grew rampant over the pathways until in a few years we had a jungle of unlabelled bromeliads. Fortunately, Mulford had segregated some plants from many of the hybrid seed batches. He isolated these in the greenhouse where they were carefully labelled and cultivated as his private collection. Thereafter, his propagation was by vegetative offshoot.

Mulford did not deliberately neglect the ever-multiplying hybrids in the garden outside, but there was always a new or bigger project demanding his time and energy such as moving large palms and cycads from town for landscaping this new garden; there were lecture engagements to fulfill, and a trip or two to be taken. Every time an interested person would discuss his hybrids with him, they would say, "let's get these labelled with large, conspicuous labels." But Mulford's aesthetic sensitivity would not permit such a thing to obtrude upon the beauty of the scene. As time went along, though, he realized that it was important to do the very thing that offended him.

So, in 1971, he welcomed Dr. Richard Lewis, a long-time botanical friend from Cornell University, to help in this big job. Dr. Lewis felt with urgency the importance of spending more than two weeks of his vacation time in labelling and photographing Mulford's bromeliad hybrids. He knew that Mulford was the only one who could name both parents. He wanted to make a definitive report. He came well prepared with numbered labels and other needed paraphernalia. It was a sincere effort. He and Mulford spent many hours walking back and forth over every inch of the ten acres that contained bromeliads.

Richard expected to put some control on the situation by trying to label all the hybrids as Mulford, one by one, gave him their identity. A formidable, almost impossible task! Nevertheless, a good showing was accomplished and many a bromeliad was tagged with a numbered label. A corresponding list was made, but no name was on the tag, only a number. At the time, I grumbled about this lack. When looking at a hybrid, you need the visual association of the parents' names to help fix them in your long-range memory.

If it had been a six-week project, the objective might have been fully accomplished. As it is, I have names and labels, but not attached to all the hybrids. However, I am very grateful for the working list which has made it possible to ascertain many identifications.

Unfortunately, most of Richard's photos show the hybrids on location and not isolated in a posed, identifiable position with corresponding number attached, which would have been helpful at this distant date.

We are indebted to Richard Lewis for recognizing the value of, and the need for, a complete record of Mulford's hybrids. It is hoped that this will point the direction to what must be done by a future hybridist who might be working with another set of new species from another country.

Before closing the book on Mulford Foster's hybrids here is a partial list of some of the hybrids between species, within the same genus as well as some of his bigeneric crosses which are between parents of different genera.[1]

Aechmea hybrids:		
Bert	(*A. fosteriana* × *A. orlandiana*)	1945
Burgundy	(*A. distichantha* var. *schlumbergeri* × *A. weilbachii* var. *leodiensis*)	1959
Foster's Freckles	(*A. fendleri* × *A. orlandiana*)	1961
Foster's Favorite	(*A. racinae* × *A. victoriana* var. *discolor*)	1953
Jeanne Eunice[2]	(*A. blanchetiana* × *A. fulgens*)	1960
Julian Nally	(*A. apocalyptica* #464 × *A. comata*)	1961
Miriam[2]	(*A. racinae* × *A. weilbachii*)	1960
Royal Wine	(*A. miniata discolor* × *A. victoriana* var. *discolor*)	1945
Billbergia hybrids:		
Fantasia	(*B. pyramidalis* × *B. saundersii*)	1945
Gerda	(*B. amoena* × *B. horrida* var. *tigrina rubra*)	1944
Henry Teuscher	(*B. pyramidalis* × *B. venezuelana*)	1962
Muriel Waterman	(*B. euphemiae* var. *purpurea* × *B. horrida* var. *tigrina*)	1951
Olive Baldwin	(*B. amoena* var. *rubra* × *B. leptopoda*)	1944
Cryptanthus hybrids:		
Mars	(*C. bivittatus* × *C. lacerdae*)	1950
Pie Crust	(*C. bahianus* × *C. zonatus*)	1940
Racinae	(*C. bivittatus* × *C. fosterianus*)	ca. 1950
Dyckia hybrid:		
Lad Cutak	(*D. brevifolia* × *D. leptostachya*)	1945
Neoregelia hybrids:		
Fosperior	(*N. fosteriana* × *N.* dark *spectabilis*)	ca. 1950
Morrisoniana	(*N. carolinae* × *N. farinosa*)	1955
Tillandsia hybrids:		
Califano	(*T. baileyi* × *T. ionantha*)	1965
Oeseriana	(*T. flabellata* × *T. tricolor*)	1954
Victoria	(*T. brachycaulos* × *T. ionantha*)	1954

[1] The names in each formula are in alphabetical order.
[2] First publication. See description starting on page 104.

Bigeneric hybrids:

× *Canmea* unnamed	*(Aechmea* × *Canistrum)*	1959
× *Guzvriesia* Magnifica	(comb. nov. M.B. Foster)	1963
× *Neomea* Marnier-Lapostolle	*(Neoregelia carolinae* × *Aechmea chantinii)*	1957
× *Neophytum lymanii*	*(Neoregelia bahiana* var. *viridis* × *Orthophytum navioides*	1957
× *Ortholarium* ?	*(Orthophytum navioides* × *Nidularium* ?)	1954
× *Quesmea* ?	*(Aechmea distichantha* × *Quesnelia arvensis)*	1960
× *Quesmea lymanii*	*(Aechmea distichantha* × *Quesnelia testudo)*	1960

Orlando, Florida

[Mrs. Foster wrote the two descriptions which follow to accompany her article "For the Record."]

Aechmea Miriam

According to Mulford Foster's handwritten list of hybrids, this cross was made in April 1956 with the pollen from *Aechmea racinae* var. *racinae* transferred by artist's brush to the seed parent *Aechmea weilbachii* var. *weilbachii.*[1]

The first flowering of this hybrid was April 1960. It is fortunate that the labels and records were kept so that even at this late date I could apply to register a cultivar of this seed lot named for Mulford's daughter Miriam Foster O'Neill.

This is an attractive, upright plant with light green leaves, which produces a drooping, long-lasting inflorescence of sparkling orange berries with dull greenish petals. It livens up the winter greenhouse while other bromeliads are dormant. Although it needs protection from frost, it requires minimum care while rewarding the grower with maximum visual delight.

As one of Mulford Foster's forgotten hybrids it should make an interesting new addition to any collection.

Aechmea Jeanne Eunice

This is another one of Mulford's early crosses with the pollen from *Aechmea fulgens* placed on the flower of *Aechmea blanchetiana.* This cultivar[2] is named for Jeanne Eunice Foster Smith, Mulford's youngest daughter. It is a nice, showy, tank-type bromeliad for the garden in a temperate climate. It survives all the low temperatures that occasionally visit central Florida. This hardiness is a surprise because both parent plants came from warm country. *A. blanchetiana* came from a location near Agua Preta, Bahia, Brazil, where we collected it in June 1939. We found it growing in both partial shade and in full sun (in beach sand). *A. fulgens* is

[continued on page 110]

Tillandsia weberi, A New Species from Jalisco, Mexico

L. Hromadnik and P. Schneider

In 1984, while collecting in the state of Jalisco, Mexico, we found a tillandsia which detailed study causes us to conclude is a new species. We name this plant in honor of our late friend and collaborator, Wilhelm Weber of Waldsteinberg, G.D.R., who earned a name for himself in recent years for his bromeliad research. The description follows.

Tillandsia weberi, Hromadnik & Schneider, sp. nov.

A *Tillandsia circinnatoides* Matuda, cui affinis, foliis minus nervatis indumento argenteo, habitu minore, inflorescentia longiora, angustiora, bracteis florigeris ecarinatis, minus lepidotis, sepalis brevioribus, glabris, postico 4 mm connatis, petalis latioribus, acuminatis differt; a *T. pueblensis* L.B. Smith foliis crassioribus, rigidis, brevioribus, subbulbosis, vaginis foliorum magnis, inflorescentia multo longiora et breviora, floribus dense imbricatis, rhachide stricta et bracteibus floralibus obtecta, bracteis floralibus brevioribus et multo latioribus, ovale acuminatis, introrse glabris, floribus sessilibus longioribusque et sepalis minus connatis differt.

Habitat: Mexico, Estado Jalisco, inter Pueblo Viejo et Jilotlan de los Dolores, 800 msm, epiphytica in populatio magna, associata cum *Tillandsia recurvata* (Linnaeus) L., *T. makoyana* Baker. *T.* aff. *fasciculata* Swartz petalis viridibus (!), *T. schiedeana* Steudel var. *schiedeana* C.S. Gardner, *Oncidium* cf. *cebolleta* Lindley et *Mammillaria* sp.

Holotypus: leg. *L. Hromadnik & P. Schneider 12 117,* 18.4.1984 (JE!); Isotypus (WU!).

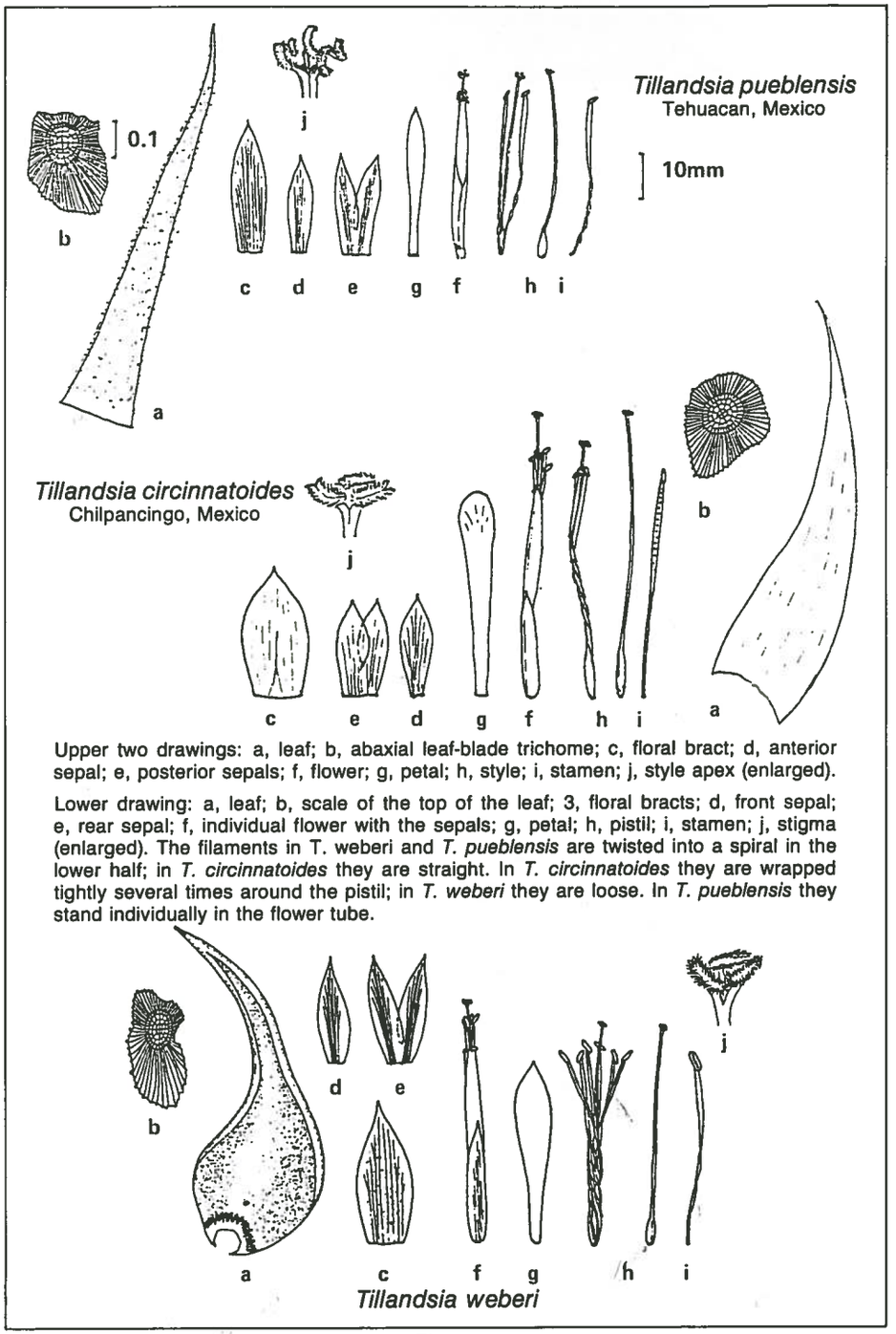
Plant stemless, single or in small clusters, epiphytic, up to 30 cm long when flowering. *Leaves* few, up to 10 cm long, succulent, rigid, hard, and pungent, velvety white lepidote with distinct, fine, parallel, longitudinal nerving, usually turning to one side, forming a loose pseudobulb almost closed at the top; *sheaths* large, oval, spoon-shaped, merging evenly into the blade, 30 mm long, 27 mm at the widest point; on the outside like the blades, but on the inside brownish and very densely covered with adpressed scales; glabrous at the base about 3 mm high, thereafter a more or less distinct violet band about 2 mm wide; *blades* upright to secund, narrowly triangular, 18 to 20 mm wide at the base, the edges quite involute so that the leaves appear subulate at the tip, up to 8 cm long, distinctly nerved, densely pruinose-lepidote with cinereous scales. *Inflorescence scape* ascending, arched, up to 15 cm long, 3 mm thick, glabrous, bright salmon red, completely covered by the *scape bracts;* the basal ones are subfoliate, green, the

the upper ones dark pink, membranaceous, nerved, densely scaled, acuminate-carinate at the tip, ca. 27 mm long, 10 mm wide at the base and there surrounding the scape; internode length 7 mm. *Inflorescence* simple, rarely with 2 spikes, spikes longitudinally lanceolate, complanate, up to 14 cm long, 6 to 8 mm wide, 10 to 15 flowers, internodes 9 mm apart, the straight rachis completely covered by the densely imbricate *floral bracts;* the latter longitudinally oval, acute, nerved, lepidote beneath, becoming glabrous, coriaceous, with a membranaceous, somewhat wavy, glabrous, smooth margin, 25 to 30 mm long, 9 mm wide, ecarinate, pink, exceeding the sepals. *Flowers* sessile, up to 50 mm long; *sepals* acute lanceolate, 20 mm long, 5 mm wide, whitish green with reddish tips and keels, thinly membranaceous, slightly nerved, glabrous, the posterior connate for 3 to 4 mm high and the keels clearly thickened; *petals* erect, 40 mm long, forming a narrow tube, up to 3 mm wide in the lower part, white, the upper half blue-violet, broadened to 7 mm, with a distinct tip, the latter narrowly rolled back. *Stamens* and *pistil* projecting from the flower tube (subgenus *Tillandsia); filaments* up to 45 mm long, ribbon shaped, broadened in the upper third, blue-violet, otherwise white, thin, spirally twisted in the lower half around the longitudinal axis, and altogether loosely wrapped around the style; *anthers* yellow, 3 mm long, 1.5 mm wide. *Pistil* 50 mm long, exceeding the stamens; *ovary* 6 mm long, 2mm wide, whitish green; *style* 42 mm long, filiform, white; *stigma* white (the stigma type can be attributed most easily to Type I of the system according to A. Gilmartin and G. Brown (1984); however, the three narrow, distinctly elongated stigmatic lobes are individually spiral).

Holotype: L. Hromadnik & P. Schneider 10 117 (holotype JE!, isotype WU!), between Pueblo Viejo and Jilotlan de los Dolores, 800 msm, Jalisco, Mexico, 18 April 1984.

Habitat and distribution: The species is known up to this time only from the type locality. It grows there as an epiphyte in a great population on thorn bushes and in low, dry forests along with *T. recurvata* (Linnaeus) L., *T. makoyana* Baker, a beautiful, green-flowered *T.* aff. *fasciculata* Swartz with reddish leaves. *T. schiedeana* Steudel var. *schiedeana* C.S. Gardner, *Oncidium* cf. *cebolleta,* and a *Mammilaria* species.

Our plant is very similar to *T. circinnatoides* Matuda in its vegetative state. The tight bulb shape is similar. The nerving of the leaf blades, however, is less, the cinereous scaling is more distinct, the leaves are mostly secund and shorter, the plant, in general, is smaller. The inflorescence is distinctly different from *T. circinnatoides,* where the inflorescence is commonly surpassed by the leaves. The average ratio of plant length to length of the inflorescence in *T. circinnatoides* is 1:1.2; in *T. weberi* it is 1:3. Also, the inflorescence in our plant is considerably narrower (8 mm compared to 20 mm). Further differences are in the ecarinate, less distinctly nerved and slightly scaled flower bracts and in the smaller, glabrous



Upper two drawings: a, leaf; b, abaxial leaf-blade trichome; c, floral bract; d, anterior sepal; e, posterior sepals; f, flower; g, petal; h, style; i, stamen; j, style apex (enlarged).

Lower drawing: a, leaf; b, scale of the top of the leaf; 3, floral bracts; d, front sepal; e, rear sepal; f, individual flower with the sepals; g, petal; h, pistil; i, stamen; j, stigma (enlarged). The filaments in T. weberi and *T. pueblensis* are twisted into a spiral in the lower half; in *T. circinnatoides* they are straight. In *T. circinnatoides* they are wrapped tightly several times around the pistil; in *T. weberi* they are loose. In *T. pueblensis* they stand individually in the flower tube.

Fig. 5:

[continued on page 131]

Tylenchocriconema alleni, A Pathogen of the Bromeliad *Tillandsia flabellata*

P.S. Lehman

In 1974, an unusual nematode species was recovered from soil about the roots of a bromeliad shipped from Guatemala to California. This nematode was described as a new species and named *Tylenchocriconema alleni* Raski and Siddiqui (2). The genus and species of the bromeliad associated with the soil from which the type species was recovered was not determined. Nor was it known if *T. alleni* parasitized the roots or foliage of bromeliads or any other plant. The biology of this nematode remained unknown until 1984, when a nematologist in The Netherlands observed *T. alleni* parasitizing the leaves of *Tillandsia flabellata* Bak. (1).

Key characteristics of *Tylenchocriconema alleni.* Females have an enlarged metacorpus which merges with the procorpus, and males have a degenerate esophagus. These are characteristic of the superfamily Criconematoidea. This nematode, however, shares other characteristics with the superfamily Tylenchoidea, such as long caudal alae in males, elongate isthmus in females, and fine body annulation in males and females (Fig. 6). Because *T. alleni* shares characteristics with both superfamilies, Raski and Siddiqui gave it the generic name Tylenchocriconema and placed it in a new family and superfamily, Tylenchocriconematidae and Tylenchocriconematoidea, respectively.

Parasitic behavior. Nematodes do not penetrate the leaf, but feed by only piercing the leaf cells with their stylets (Fig. 7). The largest number of *Tylenchocriconema alleni* are found in the crown of the plant, just below the waterline. As many as 35,000 nematodes have been recovered from an infected plant (1).

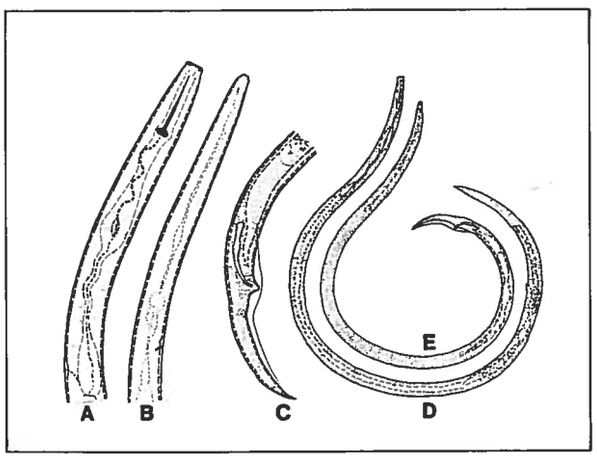


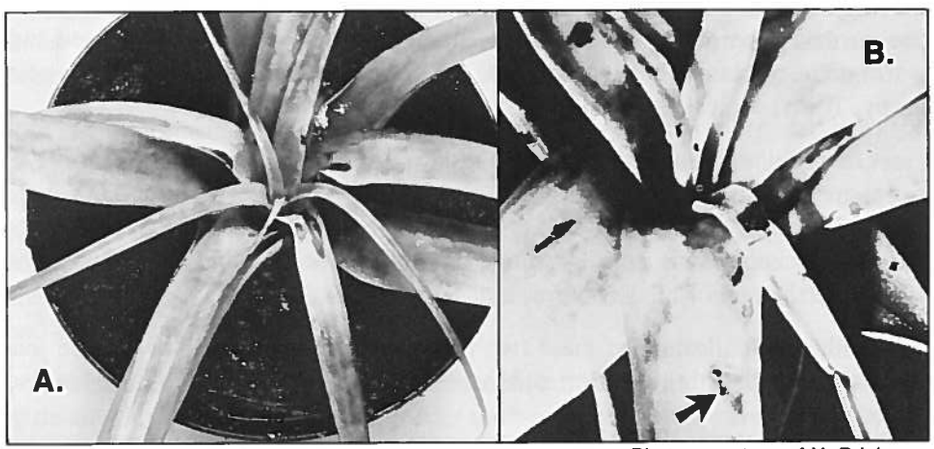
Fig. 6
Tylenchocriconema alleni. A. female, anterior end. B. Male anterior end. C. male tail. D. Female, full length. E. Male, full length (after Raski and Siddiqui).

Fig. 7
Tylenchocriconema alleni feeding on *Tillandsia flabellata* leaf.

Photo courtesy of H. Brinkman

Symptoms. Healthy plants begin to show light brown spots on the top leaf surface six weeks after inoculation with this nematode. Later these spots become discrete, dark brown lesions (Fig. 8). As the infection progresses, flowering is inhibited, and severely infected leaves die. Severely infected plants may die.

Control. When the leaves die, clusters of nematodes and eggs remain on the dried leaves. These clusters appear to the naked eye as a wool-like mass. It is possible that nematodes may be dispersed on dead leaf material (1). Dead leaves of infected plants should be discarded.



Photos courtesy of H. Brinkman

Fig. 8: Lesions on leaves of *Tillandsia flabellata* caused by *Tylenchocriconema alleni.* A. General aspects of a plant showing several lesions in the crown. B. Close-up of early symptoms of lesion development (arrow).

Preliminary research indicates that this nematode may be controlled with oxymyl (1). Concentrations of 0.005% a.i. apparently gave complete control, and a higher concentration of 0.025% a.i. was not phytotoxic (personal communication Dr. P.W. Maas, Wageningen, The Netherlands).

Survey and Detection. Bromeliads originating from Central America should be inspected very carefully for this nematode, although the possibility of its originating from European countries or from other parts of the United States should not be precluded. The author is interested in surveying *Tillandsia flabellata* and other bromeliads in Florida for *Tylenchocriconema alleni*. Submit bromeliads with leaf lesions to the Div. of Plant Industry Nematology Bureau, and indicate that the purpose of the submissions is for the *T. alleni* survey. [The author will be pleased to have the cooperation of all readers who are aware of this problem or who may suspect that they have infested plants. Ed.]

LITERATURE CITED:

1. Brinkman H. 1985. *Tylenchocriconema alleni* enn bijzonder aaltje in de bladkoker *Tillandsia flabellata*, p. 79-80. *In* Jaarboek 1984. Plantenziektenkundige Dienst, Wageningen, The Netherlands.

2. Raski, D.J., and I.A. Siddiqui. 1975. *Tylenchocriconema alleni* n.g. n.sp. from Guatemala (Tylenchocriconematidae n. fam.: Tylenchocriconematoidea n. superfam.; Nematoda. J. Nematol. 7:247-251.

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For the Record: on M.B. Foster's Hybrids *[continued from page 104]*

from the state of Pernambuco, north of Bahia, and nearer the equator. These diverse habitats gave the hybrid the adaptability so welcome in establishing it in our garden. One never knows what a hybrid will do. Mulford combined two warm-country plants, but in this cross we have a plant that is amazingly cold hardy. It isn't logical, but that is the result.

Out of light green leaves rises a long-lasting, four-to five-foot flower stalk of a pleasing rose to pink with a flower head holding blue flowers. It is a fairly large plant with leaves two and one-half to three feet long and three inches wide. Since the inflorescence holds its color for several weeks, it is another delight for the Florida garden.

With the publication of these two hybrids, Miriam and Jeanne Eunice join company with their brother Bert and their sister Gerda who already have been so honored.

NOTES:

[1] Please see pages 123-124 of this issue for the proposal to change this designation from "variety" to "forma."

[2] Both of these plants are available from Al Muzzell, New World Bromeliads, P.O. Box 14442, University Station, Gainesville, FL 32604.

BOOK REVIEWS. An Encyclopedia of Bromeliads

Bromeliads: Beautiful, Impressive, and Easy to Grow, by Victoria Padilla. New York: Crown Publishers, 1986, 128 p., illus. (some color). $12.95 (paperback reprint of the 1973 edition).

At the outset, it is important to remember that the bromeliad is relatively a newcomer in the plant world. Popular first in Europe in the early 1900s, it has found itself in the United States only in the last 20 years. Its popularity is soaring.

Its first cousins—the cactus, the succulent, and the orchid—have established themselves as the darlings of plant lovers. Now household words, they have indeed become the "in" plants. Literally scores of informative works on these favorites have been available.

Not so for the bromeliad. Were it not for publications such as Miss Padilla's, the bromeliad might well have remained just a minor attraction or a passing fancy. Wherever the bromeliad is placed in public view—be it at a plant show, exhibit, or demonstration—myriad questions arise from the awakening and curious public. The most frequently asked queries are: Just what are these beautiful creations? How does one grow them? Miss Padilla tackles both these questions head on and emerges with exceptionally easily digested answers.

While *Bromeliads* will be of some mild interest to the plant lover in general, it will have little attraction for the professional botanist or horticulturist. However, for the lay bromeliad collector it is the bible and certainly a must item for the enthusiast's library.

It is not only a valuable reference book but also a carefully executed instructional manual. This is a publication devoted to and written for the serious bromeliad fancier.

In the preface, Miss Padilla tells how she first became fascinated with the bromeliad. She laments the fact that when she started her collection some 45 years ago, there was little or no material for the hapless initiate. Thus, her mission was to furnish to the beginner not only a reference book, but also a thesis on the history of the plant, its horticulture, its nomenclature, and its culture. In addition, she presents a glossary, and concludes with a very detailed listing of all the genera and their countless species.

Each plant found in this mighty effort is identified with meticulous attention to detail. Her descriptions tell the reader for whom the plant is named (usually the discoverer), how to pronounce the name of the plant (no small task!), the year and location it was discovered, and the name of the area where the plant lives. This mass of information is followed by a thorough description of the plant's size, the leaves and the flowers.

Immensely appealing are the illustrations, 63 in realistic color and 93 in black and white. Of equal importance, the author allots 100 pages to the descriptions of 54 genera or families—all members of the pineapple kingdom. Without a doubt, this work will be classified as the best yet to appear in the marketplace. It is a gargantuan encyclopedia.

This grand lady of the bromeliad world was an eminent expert in every sense of the word, a horticulturist, writer, lecturer, professor emeritus in English literature, and the cofounder of the Bromeliad Society, Inc. The verb "was" is used in the previous sentence for the reason that Victoria Padilla died September 16, just 11 days after her book was published. The bromeliad world has lost a jewel.

Jack Percival
San Diego, California

Reprinted from the *San Diego Union*, Nov. 2, 1986, by permission.

An Introduction to Growing Bromeliads in Australia, produced by the Bromeliad Society of New South Wales; edited by Merv. Henderson. Bankstown, N.S.W.: The Society, 1986. 15 p., drawings, color photograph on cover. $Aus. 2.50 plus postage.

In these few pages, four members of the Bromeliad Society of New South Wales have written a summary of their experience with growing bromeliads. They explain the nature of this plant family, and discuss very briefly facts that the beginner needs to know about cultivating these plants. The experienced grower will find this booklet too simple, but it might be just the right amount of persuasion for someone with his or her first bromeliad (an *Aechmea fasciata?)* to get started as a hobbyist. Besides answers to basic questions, there is information about where to seek advice, a buyer's guide, and a recommended reading list.

Many of us have experienced the frustration of getting started in this hobby: the unfamiliar words, the lack of basic equipment, the sensation that everybody else is surely expert. This is the time that societies gain or lose recruits and it could be that a copy of a basic work such as this, combined with a few friendly words, would make the difference.

Other societies (including the Bromeliad Society, Inc.) have created similar publications and that effort is to their credit. The Bromeliad Society of New South Wales has, however, published an exceptionally attractive and informative item.

TUL

[You may order copies of this booklet from: The Secretary, Bromeliad Society of NSW, 50 Irvine Street, Bankstown, NWS 2200.)

Bromeliads of the Coast of Jalisco, Mexico

Patricia Magaña

Mexico is one of the countries, like many in Latin America, with a poorly known flora. The state of Jalisco is no exception. The coast, a shoreline of about 250 kilometers, is bordered on the west by the Pacific Ocean, on the north by the state of Nayarit, and on the south by the state of Colima. The entire area was opened when the Manzanillo-Puerto Vallarta highway was constructed and since then many places have been occupied with hotels and with farming. Nevertheless, there are still many places where new species are being found.

A project to learn more about the flora of the coast of Jalisco began with studies by the staff of the Biological Station "Chamela" which is operated by the National University. It is situated near Barra de Navidad on the highway to Puerto Vallarta. As part of this project, I collected bromeliads during 1985 for my bachelor's thesis, working in the National Herbarium of Mexico.

The weather in Jalisco is hot. It rains during the summer and there is a dry season that lasts for seven to eight months. The precipitation is from 800 to 1,200 mm per year, with temperatures ranging from 22 to 26 degrees centigrade.

The area is dominated by two types of vegetation: tropical deciduous forest and tropical semideciduous forest. The former is the more extensive with trees from 8 to 15 m tall, almost all of them losing their leaves during the dry season. The more conspicuous species are *Lysioloma divaricata, Bursera* sp., *Ceiba aesculifolia, Lonchocarpus* sp., *Forchhameria pallida.* The most important epiphytes are species of the genus *Tillandsia.*

The tropical semideciduous forest has trees which vary in height from 15 to 35 m, and half of the species lose their leaves during the dry season. It consists chiefly of *Ceiba pentandra, Hura polyandra, Ficus* spp., *Salix chilensis, Pithecellobium landeolatum, Brosimum alicastrum,* and *Enterolobium cyclocarpum.* The two most conspicuous epiphytic families are the Orchidaceae and the Bromeliaceae.

On the coast there are limited stands of mangrove *(Rhizophora mangle)* and palm *(Orbignya cohune)* and epiphytes are infrequent.

Twenty-six species in six genera were registered in the Bromeliaceae. Two kinds of keys were prepared: one for the identification of herbarium specimens and one based on durable characters for identification of living plants at the Biological Station.

• Two species of *Aechmea* are found on the coast. *Aechmea mexicana* Baker, and *A. bracteata* (Swartz) Grisebach var. *pacifica* Beutelspacher. The latter is

Arturo Solis

Fig. 9

Bromeliad palmeri, first collected in Colima, Mexico, this species with meter-long leaves is found on the coast of Jalisco.

Emily J. Lott

Fig. 10

Tillandsia ionantha var. *ionantha* grows abundantly on shrubs and trees in Jalisco. This group is in full bloom.

Fig. 11

Although *Tillandsia jaliscomonticola* was described in 1975, it is new to the *Journal.* The 25 cm-tall spikes are half red and half green.

Patricia Magaña

Emily J. Lott

Fig. 12

One of the two most beautiful bromeliads of the southwest coast of Mexico, *Tillandsia roland-gosselini* has recurved leaves which turn red in full sun.

very abundant and striking. A specimen at the Biological Station has rose petals, an unusual character since it has always been reported with yellow flowers. This species is a characteristic epiphyte on the coast, with its brilliant rose bracts, growing almost always in shaded places.

• *Billbergia pallidiflora* Liebmann is a beautiful plant. Flowering lasts only three or four days in August. It is easy to recognize because of its erect, banded leaves. It can be found in humid places in the forks of the trees.

• The genus *Bromelia* is represented on the coast with three species: *B. palmeri* Mez (Fig. 9),[1] *B. pinguin* Linnaeus, and *B. plumieri* (E. Morren) L.B. Smith. The first two have long inflorescences with flowers possessing yellow and rose petals. *Bromelia plumieri* has a sessile inflorescence with inner leaves that turn red during anthesis.

• Catopsis is one of the less known genera in Mexico. In Jalisco, *C. nutans* (Swartz) Grisebach is found in tropical subdeciduous forest. This is a rare species on the coast. It flowers during October.

• I found a new species of *Hechtia* and will soon publish a description.

• *Tillandsia* is the largest bromeliad genus on the coast. Tillandsias form a conspicuous part of the landscape, especially during the dry season when most trees lose their leaves and the green foliage of the epiphytes is easily recognized.

T. caput-medusae E. Morren can be found in shady places, always associated with ants, from Puerto Vallarta to the town of Chamela. It varies in size. Flowering is in May.

T. dasyliriifolia Baker is undoubtedly one of the most debatable species. I found it growing profusely in Chamela with its large, undulate inflorescence and violet petals. One of the characters I used to separate it from the other tillandsias was the gray-blue color of its leaves.

T. diguetii Mez & Roland Gosselin ex Mez is a little beauty, known only from the type locality of Colima. You can admire its rose, recurved leaves during anthesis in May. It grows mostly in shaded places.

T. ionantha Planchon var. *ionantha* is very abundant, growing on many species of shrubs and trees. The rose color of its leaves during anthesis makes them very attractive.

In the more humid zones, such as Puerto Vallarta, *T. jaliscomonticola* Matuda (Fig. 11)[2] is characteristic not only in the tropical forest, but also higher in the oak-pine forest. It has very large spikes, to 25 cm tall, that are half red and half green, and possess abundant nectar.

T. setacea Sw. and *T. bartramii* Elliott are two species which are difficult to distinguish because of their filiform leaves. Without flowers, *T. setacea* can be

identified by its narrower, bright green leaves, and *T. bartramii* by its grayish leaves that turn red at different times of the year. Both of these species were recorded in the survey. Another species with filiform leaves is *T. juncea* (Ruiz & Pavon) Poiret. It is distinguishable from the two other narrow-leaved species by its wider and longer leaves and its red, digitate inflorescence. This species grows in the more humid places on the coast in the tropical semideciduous forest near Chamela.

T. paucifolia Baker covers the trees like a plague. I could find it only in the viviparous form which is very conspicuous on the mangroves and other trees near the sea.

T. pseudobaileyi C.S. Gardner is one of the bulbous types. It forms clusters on the trees and can be easily recognized by the dark violet veins of the sheaths of the leaves. Another plant of the bulbous group is *T. balbisiana* Schultes. It is very common in the tropical deciduous forest. It varies in size and flowers most of the year.

T. recurvata (L.) L., *T. polystachia* (L.) L., *T. schiedeana* Steudel, and *T. usneoides* (L.) L. are common on the coast, growing abundantly in many places including disturbed sites.

The two most beautiful and conspicuous bromeliads of the coast are *T. roland-gosselinii* Mez. (Fig. 12) and *T. rothii* Rauh. Their green, recurved leaves turn red in full sun. *T. roland-gosselinii* has several thin spikes and *T. rothii* only one or two spikes which are more or less inflated. *T. rothii* grows profusely in the tropical deciduous forest along the coast.

I must say that I was surprised with the variety of bromeliads inhabiting the coast because this is a very dry area, at least for five months of the year, and other authors have mentioned that epiphytes are scarce here. One of our hypotheses is that moisture in the air, resulting from the daily drop in temperature and the proximity of the sea, make moisture and minerals available to the bromeliads to absorb with their specialized scales. I also found much variability in size and color of the plants, and the possible formation of hybrids that make this group of plants a family very interesting to investigate, not only in the state of Jalisco, but in all of Mexico.

ACKNOWLEDGMENT:

This project was made possible by the support of the Herbario Nacional of the Instituto de Biologia de la Universidad Nacional Autonoma de Mexico and the Consejo Nacional de Ciencia y Technologia, and the report was prepared for publication during an internship in the Marie Selby Botanical Gardens with the support of the Bromeliad Society, Inc.

NOTES:

1. Although described in Bromelioideae (Flora Neotropica 14/3), this is the first mention and the first picture of *Bromeliad palmeri* in these pages.

2. Cact. Suc. Mex. 20(4):99, fig. 51; Oct.-Dec. 1975. Mexico: Jalisco (Holo: MEXU).

Herbario Nacional
Mexico, D.F., Mexico

Jack Roth, 1911–1987

Elmer J. Lorenz

There is always a sense of loss when one has to report that a special friend has passed away. Such is the case of reporting the death of Jack Roth who died February 3, 1987. He was a devoted plantsman who grew many superb bromeliads. Jack joined the Bromeliad Society, Inc. about 1957 and served as treasurer from 1960 through 1969. His knowledge and experience contributed greatly toward the financial stability of the society.

Jack first became interested in bromeliads while living in North Hollywood where he amassed an outstanding collection in spite of the extremes in temperatures and the low humidity. It was, however, when he moved to his new home in Hollywood HIlls that he developed and landscaped some two and one-half acres of hillside property with bromeliads, cycads, palms, succulents, orchids and numerous other rare and exotic plants. Viewing his garden at any time of the year would attest to the exuberant and continuous display of brilliant color and growth. His son Vern supplied a great deal of love, interest, labor, and enthusiasm in growing the plants.

Although he had inexhaustible enthusiasm for all bromeliads, tillandsias were his favorites. They were everywhere in his garden in endless quantity and variety. They hung from the trees, the eaves of the garage, the shadecloth supports, the fence—wherever you could fasten a tillandsia there would be a group. While visiting Jack, Dr. Werner Rauh noticed a tillandsia that he had collected some seventy miles north of Manzanilla, on the road to Puerto Vallarta, Mexico. After considerable research, Dr. Rauh decided that it was a new species and named it *Tillandsia rothii.*[1]

I think one of the best pictures of Jack is that shown on page 120 of the May-June 1979 *Journal of the Bromeliad Society* showing him holding a huge bromeliad and with a matching smile on his face. The photograph is entitled, "The Happy Warrior." I know the warrior is still happy in his new hunting grounds.

Los Angeles, California

[1]Rauh, W. Bromelienstudien. Tropische und subtropische Pflanzewelt 16 (1976). I (V):30-36. J. Bromel Soc. 28:246-249, col. photo p. 288.

DR. AMY JEAN GILMARTIN, director of the Ownby Herbarium and professor of botany, Washington State University, Pullman, has graciously agreed to serve on the Editorial Advisory Board. Dr. Gilmartin has served the society as a director from 1971-1980 and as a frequent contributor to the *Journal.* Through her urging, all scientific contributions to the *Journal* are being reviewed by other scientists before being accepted for publication. This policy serves to improve the reliability of such material and to enhance the stature of the *Journal.*

TUL

A Miracle of Mother Nature

Mike and Jane Keys

In midsummer 1981 we visited Costa Rica and received from a private collector two small *Vriesea imperialis* plantlets. We gave one to our friend in Honolulu and kept the other. Ours soon started a massive collection of offsets.

On October 29, 1982, we potted one and allowed it to grow. On June 1, 1984, we planted this one in the ground, potless, and let it continue to grow in full sun. About February of 1986 we noticed a change in the growth of the plant: the center seemed to open up. We noticed by March that it appeared to be trying to flower, and by April there was no doubt of its intention.

There was continuous growth during May and by June 15th the scape was 8 inches above the center and coloring up. By June 30th the scape was up to 26 inches high. At this time 15 floral bracts appeared in a terminal spike. By mid-July the spike and scape had grown to 36 inches with 17 floral bracts. The lower ones were 3 inches long. On July 18th the first flower appeared and by the 21st there were four and the first one was still beautiful. The spike and scape were now 52 inches high. By the 25th there were 8 floral bracts with one flower each. By the end of August all floral bracts had been or were in bloom. Sometimes as many as 11 of the 17 bracts were in flower.

By mid-September all bracts had bloomed except the tip of each bract. On November 1st there were only 3 small buds on the tip of each bract so it appeared to be about finished blooming.

We have been unable, at this time, to get plantlets to mature on this plant. Perhaps after all blooming is finished we shall see if it produces plantlets.

It has been a wonderful summer to have such a beautiful plant to enjoy even though it is not as tall or as large as those that wait 20 or 30 years to bloom. It is only five feet tall. At our ages we would never see it flower at the usual growth rate, so we accept the smallness and beauty as a gift for our enjoyment and the pleasure of showing it to many bromeliad lovers.

Miami, Florida

Fig. 13
Vriesea imperalis usually blooms after 20-30 years, but the author's specimen flowered in only five.
Mike Keys

Dyckia estevesii; A Striking New Species from the Mato Grosso

Werner Rauh

One of the most striking dyckias discovered during the last year is the new *Dyckia estevesii,* named in honour of Eddi Esteves Pereira (Goiania), who found it in a xerophytic bush between the town of Caiaponia and the Rio Araguaia, in the state of Goias, Brazil.

This new species differs from all of the other known dyckias by the distichous arrangement of the leaves—also in older plants—which forms a big fan. This appearance is known in the subfamily of the Pitcairnioideae only in *Pitcairnia altensteinii,* in which the rosette leaves are also distichous. This leaf arrangement occurs more frequently in *Tillandsias* of the subgenera *Phytarrhiza* and *Diaphoranthema. Dyckia estevesii* shows no relationship to other species and has a very isolated systematic position.

Dyckia estevesii Rauh, sp. nov.

Planta singulariter vel gregarie crescens, florens usque ad 1.2 m alta caule erecto, 8-10 cm longo, usque ad 10 cm diametiente basim versus incrassato

Author

Fig. 14

The leaves of Dyckia estevesii are not only armed with strong, backwards-curving teeth, but they present a fan-like appearance.

Author

Fig. 15

The scape of *Dyckia estevesii* is thin, erect, and long.

vaginis foliorum dense obtecto, a basi se ramificante. *Folia* numerosa disticha. *Vaginae* distinctae imbricatae, 5 cm longae, usque ad 10 cm latae, iuventute virides, basi brunneae, mox stramineo-desiccantes, glabrae, in parte superiore margine squamis altiformibus, subtus striatae. *Laminae* iuventute erectae, senectute recurvatae flabellum formantes, paulum succulentae, anguste lineales, supra vaginam, 3.5 cm latae, in apicem longum pungentem se angustantes, supra atrovirides vel brunnescentes, subtus cano-virides, distincte striatae, disperse et seriatim lepidotae, in dimidio basali margine retrodentatae; *dentes* 1-3 cm inter se distantes, 5 mm longi, basi 3 mm lati, in apicem durum pungentem excurrentes. *Inflorescentia* axillaris usque ad 1 m alta, laxissime bi- vel tripinnata. *Scapus* tenuis, erectus, usque ad 50 cm longus, glaber, cano-viridis. *Bracteae scapi* internodiis breviores, basales lamina anguste lineali margine laevis, superiores triangula-acuminatae, usque ad 5 mm longae. *Bracteae primariae* squamiformes, multo breviores quam pars basalis sterilis usque ad 5 cm longa ramorum lateralium primi ordinis; ei 5-10 longi, basi prophyllo rhachidi tenuissima angulata laeviter flexuosa. *Flores* laxissime dispositi erecti partim secundi, subsessiles usque a 1 cm longi. *Bracteae florales* parvae, exiguae, multo breviores quam sepala, late ovales, acuminatae, 2 × 2 mm metientes, glabrae, rufescentes. *Sepala* oblongo-lanceolata, 5 mm longa, 2 mm lata, obtusa, subcarinata, usque ad basim libera; *petalis* multo breviora, ea 1.5 cm longa, anguste

ligulata, erecta, carinata, rufescentia apicibus non divergentibus. *Stamina* tantum antheris exserta; *filamenta* taeniformia, basi in tubum plus minusve 1 mm altum connata, ceterum libera. *Ovarium* superum 1.3 cm longum stylo brevi et stigmate capitato.

Holotypus: *E. Esteves Pereira* s.n. (B.G.H. 67 420), in herb. inst. bot. system. univ. heidelb. (HEID), Sept. 1985.

Patria et distributio: Terricola in sylvis siccis inter villam Caiaponia et flumen Rio Araguaia (500 m), Estado de Goias, Brasilia.

Plants single or forming groups, flowering up to 1.2 m high, with a thick, erect stem, 8-10 cm long and up to 10 cm thick at the onionlike base, covered by the old sheaths, producing offshoots at the base. *Leaves* numerous, erect, distichous. *Sheaths* conspicuous, densely imbricate, 5 cm high, 10 cm wide, green, brown at the base, nerved beneath, lepidote; scales at the margin of the upper part of the sheaths eccentric and alate. *Blades* erect when young, recurved with age, succulent, narrowly triangular, 3.5 cm wide above the sheath, tapering gradually into a long, pungent tip, dark green up to brownish above, gray-green beneath, prominently nerved and lepidote (scales in rows), with stout, mostly retrorse teeth at the margin, these 5 mm long, 3 mm wide at the base, very pungent, the upper third of the leaves toothless and even. *Inflorescence* lateral, up to 1 m long, laxly bi- or (rarely) tripinnate. *Scape* thin, erect, up to 50 cm long, glabrous, brownish. *Scape bracts* shorter than the internodes, the basal ones with a short blade, the upper ones bladeless, triangular, acute, up to 5 mm long. *Primary bracts* squamiform. *Branches* erect, with a 3-5 cm long, sterile base, 5-10 cm long; rachis very thin, somewhat flexuous, glabrous. *Flowers* laxly arranged, erect, sometimes secund upwards, subsessile up to 5 mm pedicellated, up to 1.7 cm long. *Floral bracts* very small, inconspicuous, much shorter than the sepals, broadly ovate-acute, 2 × 2 mm, glabrous, reddish-brown. *Sepals* lanceolate, obtuse, 5 mm long, 2 mm wide, subcarinate, free, much shorter than the *petals*, these up to 1.5 cm long, narrow-ligulate, erect, reddish-brown, exserted by the tips of the anthers. *Filaments* flattened, free above the short (1 mm) common tube. *Ovary* epigynous, 1.3 cm long with a short style and globular stigma.

Holotype: *E. Esteves Pereira s.n.* (B.G.H. 67 420), in Herb. Inst. System. Bot. Univ. Heidelberg (HEID), Sept. 1985.

Locality and distribution: Terrestrial in a deciduous forest between the town of Caiaponia and the Rio Araguaia, Goias, Brazil.

The plant is known until only recently from the type locality. I am very indebted to Eddi Estever Pereira for sending live material.

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

Notes from Herbarium Bradeanum, IV

Edmundo Pereira and Elton M.C. Leme

Typical of the Brazilian Atlantic forest, the *Aechmea weilbachii* Didrichsen may be found in the states of Rio de Janeiro and Espírito Santo. As an epiphyte in places protected from direct sunlight, it inhabits the middle height of the trunks of the trees which form the vegetation of the mountainside at altitudes up to approximately 1,000 meters. In the State of Rio de Janeiro, it can be seen frequently in the Tijuca National Park (where the type of the species was collected), and in the National Park of Serra dos Orgãos.

From variations observed in small populations, the variety *leodiensis* André (1887) and the form *pendula* Reitz (1975) were created. The former, very little known in nature, was collected in 1974 by Raulino Reitz in the county of Magé at a low altitude. That fact represents a very important datum as to the geographical distribution of this variety. As to the f. *pendula,* which can be distinguished easily from the typical form by the pendulous inflorescence (Fig. 16), we concur with the status *forma* adopted by its author because it gives a better picture of these variations of populational groups. We note that the occurrence of the latter is limited to the area where the typical *A. weilbachii* grows.

Fig. 16
Aechmea weilbachii forma *pendula* is easily recognizable by its very long, pendulous inflorescence.

J.L. Moutinho

This being so, following the example of Reitz and with the intention of putting the group in better order, we propose a new combination, besides a new form, as follows:

A. *Aechmea weilbachii* Didr. forma *leodiensis* (André) Pereira & Leme, comb. nov.

Basionym: *Aechmea weilbachii* Didr. var. *leodiensis* André, Revue Hort. 59:31; 1887. **Type.** *Paris Hortus s n* (P? n v), Brazil. Supplementary collection: *P.R. Reitz 7 663* (HBR n v), Magé, Rio de Janeiro, Brazil, July 20, 1974.

B. *Aechmea weilbachii* Didr. forma *pendula* Reitz, Bromelia 1 (Sellowia no. 26):33, pl. 3; 1975. **Type.** *P.R. Reitz 7730* (HBR n v), Poço Verde, Magé, Orgãos Mountains, Rio de Janeiro, Brazil, Dec. 24, 1974.

Synonym: *Aechmea weilbachii* Didr. var. *pendula* Pereira & Moutinho, Bradea 3(27): 214, pl. 6; 1981. **Type.** *D. Sucre s n* (HB), Rio de Janeiro State, Brazil, June 1981. Supplementary collection: *R. Braga & P.I.S. Braga 929* (RB, HBR, US, R, GUA), Rio-Petrópolis road, Rio de Janeiro, Brazil, Aug. 10, 1968.

C. *Aechmea weilbachii* Didr. forma *viridisepala* Pereira & Leme nov. forma. Differt a formis adhuc cognitis scapo erecto, sepalis plene viridibus et petalis atropurpureis. **Type.** *E.M.C. Leme 552* (holotype, HB, isotype, RB), epiphytic of low elevation, near Centro de Primatologia do Rio de Janeiro/FEEMA, boundary between Cachoeira de Macacu and Magé, Rio de Janeiro, Brazil, July 9, 1984. It differs from the known forms by the erect scape, green sepals, and dark purple petals.

Supplementary collection: ibid. *E.M.C. Leme 652* (RB), 1985; *R. Braga 18 & P.I.S. Braga 928* (RB, US), Rio-Friburgo road, Rio de Janeiro, Brazil, 1968.

D. *Aechmea weilbachii* Didr. forma *weilbachii,* Ann. Sci. Nat. Bot. IV.2:375; 1854. **Type.** *Didrichsen s n (C n v),* Corcovado, National Park of Tijuca, Rio de Janeiro, Brazil, 1847.

Supplementary collection: *G. Martinelli 8469 & H.C. de Lima* (RB), Faz. Capim Melado, Silva Jardim, Seser. Biol. de Poco das Antas, Rio de Janeiro, Brazil, 1983; *G. Martinelli 8513* (RB), near Quitandinha, Petrópolis, May 30, 1982; *J.G. Kuhlmann s n* (RB), Botanical Garden of Rio de Janeiro, City of Rio de Janeiro, Brazil, May 26, 1942; ibid. *G. Martinelli 4594* (RB), June 16, 1978.

Key for identification of the forms of *A. weilbachii:*

1 – Leaves green
  2 – Inflorescence erect.
    3 – Sepals lilac, petals pale purple ..... f. *weilbachii*
    3 – Sepals green, petals dark purple ..... f. *viridisepala*
  2 – Inflorescence pendant ..... f. *pendula*
1 – Leaves purple ..... f. *leodiensis*

Rio de Janeiro, Brazil

[This was the last Bromeliaceae study completed by Edmundo Pereira before his death May 16, 1986.]

Aechmea weilbachii forma *pendula* in Cultivation

Kenneth J. Brown

Imported plant shipments sometimes contain surprises and there were several in the one received in 1978. I identified two of the mystery plants in 1979, but had to wait until January 1983 for the third to bloom.

The plant was unknown to me, but I was able to determine that it was an *Aechmea.* In November 1985, I sent a blooming specimen to Harry Luther at the Bromeliad Identification Center. He identified the plant as: "BIC 263 *Aechmea weilbachii* Dietr. var. *pendula* Pereira & Moutinho." Mr. Luther added: "I believed this var. *pendula* to be the same as var. *weilbachii,* as the authors distinguished it only by having a pendant scape. Variety *weilbachii* also may have a pendant scape. I see now that var. *pendula* also has a much more laxly arranged flowers on a very geniculate rachis. . . it has caused me to reevaluate a taxon that I first believed to be superfluous."

No one with whom I have spoken was aware that this plant was in cultivation.

The plant has about 25 leaves and is about 65 cm high. When in bloom, it measures about 1 m from the top of the plant to the bottom of the inflorescence. The elliptical leaf sheaths (and therefore the base of the plant) are relatively large: 6.5 cm wide by 19 cm. The leaf blades are lanceolate, 3.5 cm wide by 36 cm and glabrous, darkish green above and below. The sheaths are spined and the blades are usually only slightly, or not at all, spined. Offsets appear on short (8-10 cm) stolons. I believe that these offsets should be left on to encourage blooming (as is the case with many *Dyckias).*

The scape is 65 to 85 cm long and brilliant coral in color, having scape bracts longer than the internodes. The primary bracts (3-4 cm wide by 2 cm) are beige before anthesis, turning coral after. The ovaries (11 mm) are fuchsia, sepals (6mm) light blue gray, and petals (11 mm) lighter blue gray, turning black after anthesis. The entire inflorescence retains good color for several months.

We have grown the plant very successfully in a cool greenhouse (13 degrees Centigrade night temperature in winter). It needs some shade in summer even at our latitude of 44.5 degrees north. It likes a loose potting mix, as we might well expect, and I grow them in plain shredded cedar bark mulch, fertilizing about every three months with a time release 14-14-14 fertilizer.

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[The term variety *is replaced by the term* forma *in this article, except where it appears in a quotation, in conformance with the preceding proposals by authors Pereira and Leme.]*

[You may write directly to Mr. Brown about the availability of this plant.]

. . .and he does windows, too

A.J. "Tony" Novak

The idea of creating a stained glass bromeliad panel for the Austin Garden Center occurred to me several years ago while I was a stained glass instructor at the local recreation center. The alliance of bromeliads and glass seemed to me a natural combination because I had also been creating displays of bromeliads for annual city and club functions to stimulate public awareness of the plants.

The first question was: Where to install the panel? The ideal location would provide good light (the heart of stained glass), and no roof overhang to create shadows. At the same time, the panel must not create problems by obscuring existing views.

The Austin Garden Center seemed like a logical location. The proposal was approved. Then it was up to me.

I evaluated every window opening in the center and found not one completely suitable space in the entire building. I finally settled on the best possible compromise: a window opening rather high at nine feet from the floor, and space (including window mullions and the inevitable roof overhang) allowing for a 62″ × 28″ panel.

Now for the design. To my knowledge, depicting the eight most popularly collected genera of the bromeliad family in one glass panel had never been done, so this construction was a "First." As an art student in Chicago after World War II, I was influenced by the work of the Dutch abstractionist Piet Mondrian. Mondrian renounced representational elements and limited his paintings to

[continued on page 132]

Bromeliad Flower Arrangement, No. 15: *Aechmea mulfordii* and *Aechmea* Luis Ariza Julia

May A. Moir

Robert Chinn for the Honolulu Academy of Art

Fig. 17
An arrangement of *Aechmea* Luis Ariza Julia inflorescence sprays with *Aechmea mulfordii* leaves.

This tall, 7 ft., arrangement of *Aechmea mulfordii,* Luis Ariza Julia and a few long leaves of *A. mulfordii* was showy. *Aechmea* Luis Ariza Julia is inclined to have a droopy spray so the twiggy branches of the paper bark tree help support the sprays and give line to the arrangement. The large terra cotta pot adds a good, warm color to the combination and is large enough to balance this amount of material.

Honolulu, Hawaii

Pitcairnia hammelii, A New Pitcairnia from Panama

Harry E. Luther

***Pitcairnia hammelii* Luther,** sp. nov.

P. rubigiosae Baker similis et affinis sed foliis laminis perlatioribus et integris et sepalis ecarinatis differt.

Plant stemless to short caulescent, erect. *Leaves* dimorphic, some reduced to bladeless sheaths, others petiolate to 75 cm long; *sheaths* elliptic, 6–15 cm long, nerved, appressed lepidote, pale, entire; *petioles* to 15 cm long, entire; *blades* lanceolate to 50 cm long, 10 cm wide, thin, entire, bright green, inconspicuously appressed lepidote abaxially. *Scape* erect, ca. 6 mm in diameter, pale lepidote but soon glabrous; *scape bracts* erect, linear-lanceolate, the tips long caudate, laxly imbricate, green. *Inflorescence* simple, to 25 cm long; *floral bracts* lance-triangular, attenuate, 3–25 mm long, the lowermost slightly exceeding the pedicels, the uppermost much shorter; *pedicels* very slender, 12–25 mm long. *Sepals* narrowly triangular, acute, 17–20 mm long, ecarinate, somewhat nerved, greenish-red. *Petals* ligulate, rounded, to 5.5 cm long, appendages with one 3 mm-long yellowish-orange (! Hammel); *ovary* ca. 3/5 inferior; *seeds* narrowly winged.

Type: Panama, Cerro Brewster on the border of Colon and San Blas; on rocks along the headwaters of the Rio Caugandi, elev. ca. 800 m, 20-25 April 1985, *B. Hammel* 13 599 (Holotype: SEL).

Distribution: Known from the type collection only.

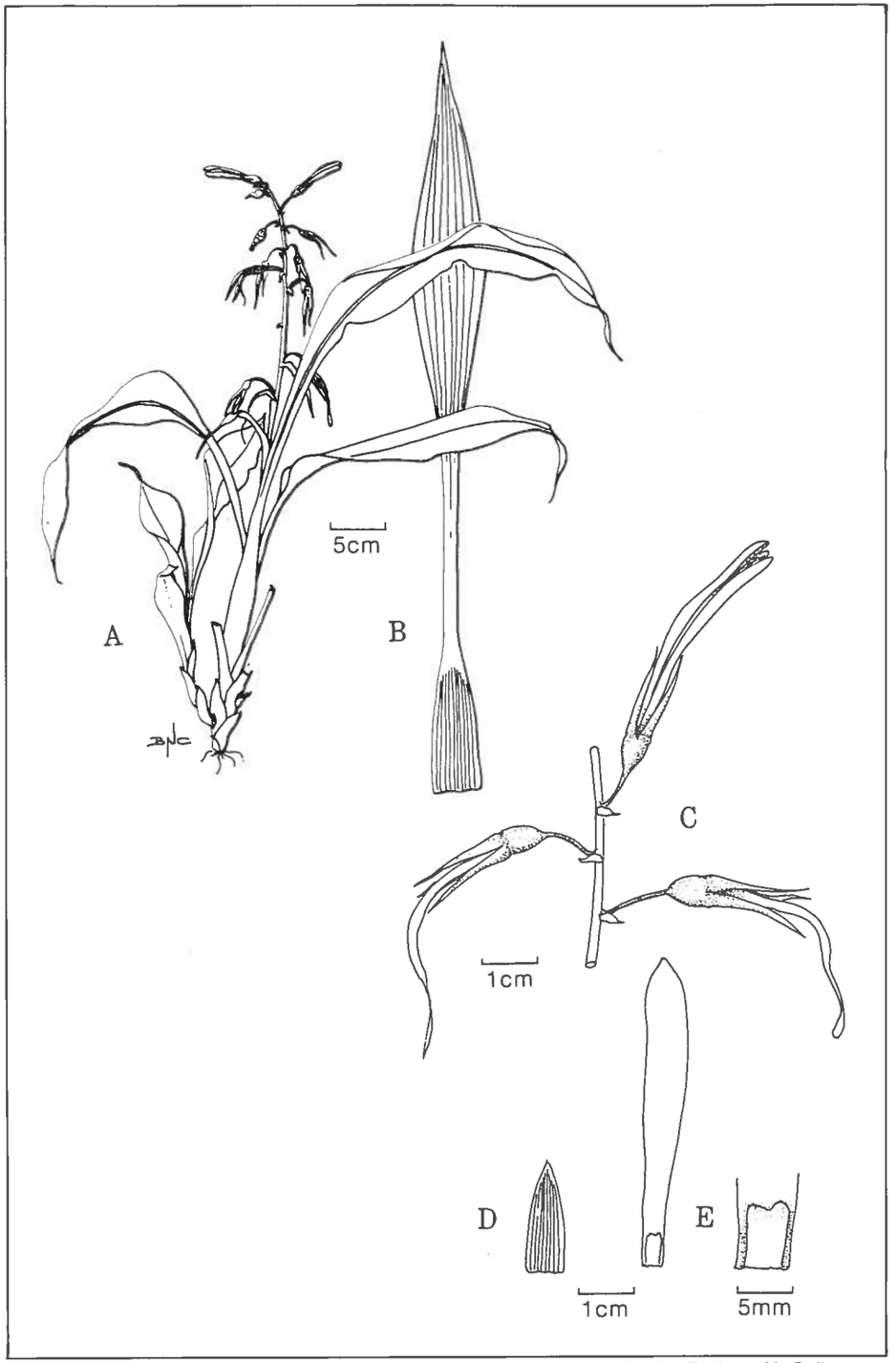
Pitcairnia hammelii seems most closely related to the South American *P. rubigiosa* Baker, but differs from this species by its much broader, entire leaf blades, slightly shorter, ecarinate sepals, and orange, not red, petals.

Living plants of this new species have been introduced into cultivation at the Marie Selby Botanical Gardens. They are presently thriving and will eventually be distributed to interested growers. The relatively small size, spineless foliage and colorful inflorescence recommend this plant for cuiltivation.

Sarasota, Florida

Fig. 18 (opposite page)

Pitcairnia hammelii Luther, a new species from Panama. A, habit; b, leaf, adaxial view; c, section of inflorescence; d, sepal; e, petal with detail of single appendage.



Drawing by Barbara N. Culbertson

Patricia Collings, New *Journal* Artist

The new decorations in the *Journal* were drawn by Patty Collings, a professional artist of Atlanta, Georgia. Miss Collings studied art for several years with both private tutors and formal instruction. She combined in her education at Mercer University, in Atlanta, the study of commercial art, botany, and business administration and while there was named "Botany Student of the Year."

A member of the Atlanta Bromeliad Society, Miss Collings wrote and illustrated a series of lessons on the botany of bromeliads for that society's newsletter. Her "Bromeliad of the Month" series with full-page drawings is well known and frequently reprinted by affiliated society newsletter editors.

We hope that we may be able to expand this series of decorations and, perhaps, add some of her line drawings to supplement Mulford Foster's decorations which have appeared here frequently ever since volume 1, number 1.

TUL

Tillandsia weberi, A New Species from Jalisco, Mexico

[continued from page 107]

sepals connate at the base for 4 mm high. The flowers in *T. circinnatoides* are considerably longer (up to 65 mm), the petals longer, widened only at the plate and rounded.

The inflorescence of our plant shows a certain similarity to *T. pueblensis* L.B. Smith, but also shows clear differences such as the following: it is very much longer and narrower, not laxly flowered as in *T. pueblensis;* moreover, the spike is densely imbricate, the rachis is straight and completely covered. The floral bracts are lepidote only on the exterior, and they are considerably wider and broadly oval acute. The flower is sessile, the sepals are less highly connate. The shorter, rigid, thickly succulent and nerved leaves in *T. weberi* form a pseudobulb-like leaf rosette almost closed at the top. The leaf sheaths are noticeably large and spoon-shaped, not narrow and triangular as in *T. pueblensis.*

Although various characters of *T. weberi* can be found in the two other species, this plant cannot be attributed to either of them. In terms of its geographic location, the nearest known habitats of *T. circinnatoides* or *T. pueblensis* are 500 and 700 km distant, respectively.

REFERENCES:

Brown, G.K.; Gilmartin, A.J. Stigma structure and variation in Bromeliaceae: neglected taxonomic characters. Brittonia 36(4); 1984.

Smith, L.B.; Downs, R.J. Tillandsioideae (Bromeliaceae). Flora Neotropica. Monograph no. 14, pt. 2. New York: Hafner Press, 1977.

ACKNOWLEDGMENT: We thank Dr. Walter Till, botanist of the Institute of the University of Vienna, for the Latin description, and Prof. Harvey L. Kendall for translating the German text into English.

Address of the authors: Lieselotte Hromadnik, Hauptstrasse 37A, 3420 Kritzendorf, Austria. Peter Schneider, Am Roth 3, 6600 Greiz, German Democratic Republic.

NOTICE: Patricia Magaña, who contributed "Bromeliads of the Coast of Jalisco, Mexico" in this issue and (with Emily J. Lott) *"Aechmea tuitensis,* a New Species from Western Mexico" in the March-April issue, was the 1986 Bromeliad Identification Center intern. In spite of their careful comparison of *A. tuitensis* with *A. macvaughii,* we printed the cover picture of the latter upside down.

TUL

NOTE TO AUTHORS

Articles proposed for publication in the *Journal* should be typewritten and be double spaced. Scientific material should follow the CBE Style Manual, 5th ed., published by the Council of Biology Editors, Inc., 1983. Other material should follow the *Chicago Manual of Style*, 13th ed., 1982. Preferred forms of illustration are: 35 mm color (positive slides for projection, not for prints), glossy black and white photo prints, and India ink line drawings. A release to copy all illustrative material for BSI (no commercial) purposes must accompany the material.

Address any questions concerning material to the editor. There is a continuing need for material, especially for personal experience with all aspects of bromeliad culture. All material will be acknowledged, proposed substantive revisions will be discussed with the author. All original illustrative material will be returned unless permanently released.

TUL

. . . and he does windows, too *[continued from page 126]*

asymmetrical balances of line, color, and area, using only horizontal and vertical strips of black on white and rectangular spots of color. He was credited with having absolute pitch in determining proportions of spatial relationships.

While I respect Mondrian's work and borrow from his ideas, I find his design limitations too austere and so must add symbolized elements within the spatial areas. As a result, my design factors included the bromeliad ecosystem shown by the yellow sun, waterglass, and airy antique glass.

The construction amounted to 13 square feet of glass for the background and at least another eight square feet for the plant representations. Most of the plants are built-up layers called "plating" to show dimensional form and color change. In addition to the glass, I used copper foil, and both lead and zinc channeling material called "came."

The panel was donated to the City of Austin in appreciation for its support of gardening activities in August, 1986. I hope that it will promote interest in bromeliads while emphasizing their qualities as art subjects . . . it might also serve to remind viewers of the artist.

Austin, Texas

Questions & Answers

Conducted by Bob Heer and Tom Montgomery

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.

I have received a number of questions concerning the problem of getting multiple offshoots from Vriesea splendens *and* Guzmania sanguinea. *M.B.F. answered in the best possible way in the Bromeliad Society Bulletin vol. 9, no. 2, March-April 1961, page 29. May we have a reprint? TJM. [As follows. Ed.]*

Q. Is *Vriesea splendens* propagated only by seed because it does not produce suckers? Can you tell me if there are any others like this and if so could you publish a list of them?

A. *V. splendens* can also be propagated by offshoots, but the manner of removing the offshoot is a bit more delicate than with most bromeliad species.

After the inflorescence of a plant has reached its maturity, the new shoot will appear near the axis next to the inflorescence instead of at, or near, the base of the plant as is usual with most bromeliads. When this new shoot has reached a height of five to six inches, it may be removed with a sharp knife. The operation is a delicate one as it is necessary to cut through the live tissue of the old plant which will separate nearly half of the plant. This cut must not injure the tissues of the new offshoots and the old basal leaves should be removed before the cut is made.

If this operation is carefully done and the cut tissues treated with Captan, it is possible that the old plant may produce one to five successive offshoots from the uninjured side. These later plants may be, generally, more easily removed than the first one. It takes some courage as well as a surgeon's skill to attempt this operation, especially if you have only one plant in your possession. (TJM adds: *To make the removal of the first pup easier and less hazardous, split, but do not remove the leaves of the older plant. This action allows for greater access and better visibility. After removing the pup, repot to a larger, deeper container and feed heavily with a balanced fertilizer. The old plant should, in time, produce a number of offsets.]*

Guzmania sanguinea will produce its new offshoot in the same location at *V. splendens.*

Many, if not most bromeliad plants, may be deliberately injured in the axis, so be careful to antiseptically treat it with Captan, so that rot or decay will not set in; offshoots, one or several, may then soon appear at the base of the plant—the main plant, of course, will not continue its growth. This

procedure, of injuring the center, may be carried out even with seedlings, two and more inches in height. Offshoots of *V. fenestralis*, generally, appear halfway between the axis and the basal leaves. These are more easily removed. M.B.F. *[Please see also M.W. Dexter, "Propagation of Poor Puppers,"* Jan.-Feb. 1987, p. 27.]

[And here is further advice from M.B.F.]

Q. What causes bromeliads to bloom prematurely? How can one avoid this? I have had a great deal of this trouble lately, especially with aechmeas, and the blooms are about one half the size they would be normally.

A. A very difficult question to answer. A long dry spell, a complete change of light exposure, a leakage of gas from a gas heater, any of these conditions might cause a premature flowering. If the blooms are half size, then the shock has most likely been gas, or some chemical change introduced. (MBF) 4/6:94.

Q. What does the word "forma" mean? We all know the word "variety," but the "forma" baffles me.

A. A variety may have one or more forms (forma), with variations not great enough to be called a new "variety." If a plant is given a specific name, for example, *Guzmania musaica,* then another plant quite similar but with plain leaves is found, this one is named *G. musaica* var. *concolor* meaning of one color—uniform. Now they both become varieties and the original species is called *G. musaica* var. *musaica.* MBF. 7/5:77 (An example of "forma" is found in the name *Aechmea weilbachii* forma *pendula.* In this case the author decided that the pendulous inflorescence was not significant enough a character to justify moving the plant to a higher category in the hierarchy, that is, to "variety.")

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.

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Calendar of Shows *[continued from back cover]*

August 1-2 — Bromeliad Society of Greater Chicago 3rd Annual Show and Sale. Chicago Botanic Garden, Lake-Cook Rd., East of Edens Hwy., Glencoe, IL. Saturday, 10:00 a.m. to 5:00 p.m.; Sunday, 9:00 a.m. to 5:00 p.m. Kevin O'Grady, (312) 835-5440, ext. 65.

August 1-2 — South Bay Bromeliad Associates 20th Annual Show and Sale. South Coast Botanic Garden, 26300 South Crenshaw Boulevard, Palos Verdes Peninsula. Saturday, noon to 4:30 p.m.; Sunday 10:00 a.m. to 4:30 p.m. Plant sales 10:00 a.m. to 4:30 p.m. both days. Open competition. Stan Oleson (213) 833-2657.

E.M.C. Leme

Aechmea weilbachii forma *viridisepala* differs from previously known forms by its erect scape, green sepals, and dark purple petals (please see pages 123–125).

Calendar of Shows

May 16-17 Bromeliad Society of Houston 19th Annual Judged Show and Sale. Greenpoint Mall at I-45 and North Belt near Intercontinental Airport, Houston, TX. Saturday, 1:00 p.m. to 9:00 p.m.; Sunday, 12:00 noon to 4:00 p.m. Plant sale hours: Friday and Saturday, 10:00 a.m. to 9:00 p.m.; Sunday, 12:00 noon to 4:00 p.m. Andy Spearry (713) 692-5350.

May 16-17 Bromeliad Society of South Florida 10th Annual Show & Sale. Fairchild Tropical Garden. Old Cutler Rd., Miami, FL. 9:30 a.m. to 4:30 p.m. daily. Trisha Frank (305) 655-4369.

May 23-24 Greater Dallas-Fort Worth Bromeliad Society 16th Annual Show and Sale. Dallas Civic Garden Center in Fair Park, Dallas, TX. Saturday and Sunday. Flo Adams (817) 467-7500.

July 18-19 Indianapolis Bromeliad Society 9th Annual Show and Sale. Glendale Mall, North Keystone and 62nd St., Indianapolis, IN. Saturday, 10:00 a.m. to 9:00 p.m.; Sunday, noon to 5:00 p.m. Elissa Haftsen (317) 251-3091, Bob Maddox (317) 459-3438.

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