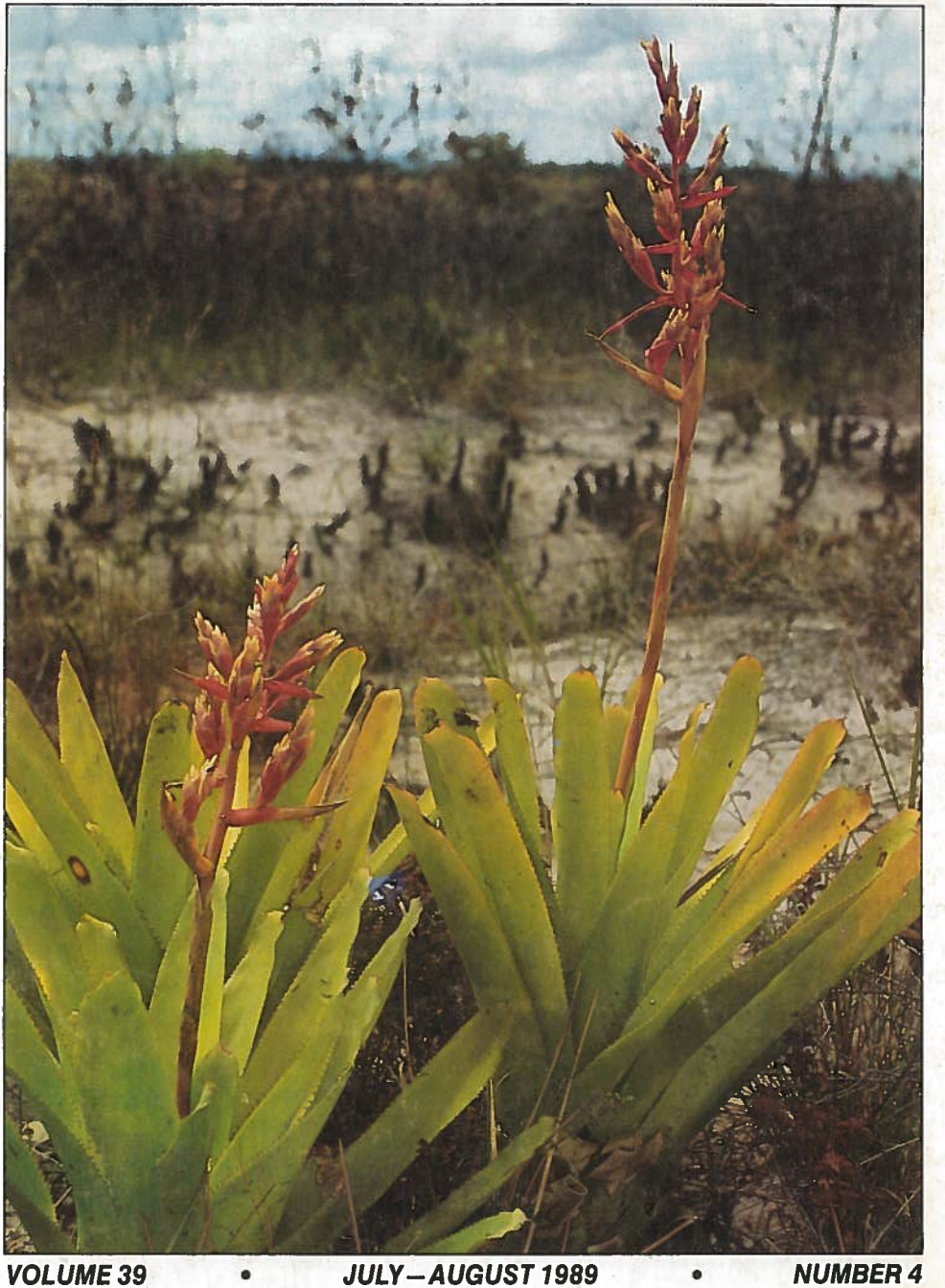
Journal of The Bromeliad Society



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Journal of the Bromeliad Society

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Cover photographs. Front: *Aechmea discordiae* is a newly described species from northeast Brazil. Photograph and text (page 162) by E.M.C. Leme. Back: *Acanthostachys pitcairnioides* (Mez) Rauh & Barthlott. Photo by H. Hemker.

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Endangered Species, My View

Chester G. Skotak

Two years ago, I climbed 3,000-foot Mount Turrubares in Costa Rica. The forest was intact with massive populations of the beautiful *Guzmania blassii* (fig. 1). On a subsequent trip this year, it was depressing to find the area completely devastated, burned not only to the ground, but the ground itself planted in corn (fig. 2). It was a six-hour climb to this peak–the most western habitat of this beautiful guzmania–and yet it was being populated by people.

Last month I went to Bolas, in the southern zone of Costa Rica, looking for a special form of *Aechmea magdalenae*. Climbing higher and higher, the native vegetation of the world around me as far as I could see was stripped away for cattle and pineapples. There were no seeds to collect, no offsets, no bromeliads at all. It was Costa Rica three million years ago. Did some unscrupulous collector pass through and load up uncountable trailerloads of plants for export to another country?

Travelling to El Cope, Panama, years ago proved to be a rewarding experience. It is the home of *Anthurium amnicola, Zamia pseudoparasitica,* and epiphytes of every description imaginable. It was a botanical wind tunnel with year round rainfall and extremely lush growth. On a recent visit there, I found that the loggers had come and now this rich ecosystem has vanished. Not overcollection, sheer devastation.

After reading the Bromeliad Society "Conservation Goals and Code of Conduct for Growers and Collectors," my first reaction was one of surprise. This code of conduct is the beginning of an attempt to put some, if not all, bromeliads on the endangered species list. I am completely opposed. Some species of bromeliads are endangered not from overcollection but from lack of it.

The Conservation Committee basically did a good job and, in theory, it should work. In practice it won't. If we assume that mankind is at the last minute of the last hour of the last day of the cosmic calendar, any conservation taking place now or 100 years from now is just nanoseconds since the Big Bang. Look around at the destruction we have caused in such a short moment.

I have replanted species of some bromeliads on farms here in Costa Rica only to go back and find all of the trees felled. Owners change, governments change, trends change. It may be that the solution is to create a series of apolitical, yet interrelated, botanical gardens around the world in different climates and altitudes to form a species bank. We cannot rely on university greenhouses or botanical gardens because their specialists come and go for whatever reasons, and with them go species collections.

Fig. 1
In 1987, massive populations of *Guzmania blassii* (left) were found on 3,000-foot Mt. Turrubares in Costa Rica. In early 1989, the author climbed to the same area and found it devastated and with *G. blassii* cooking in a cornfield (below).

photos by the author

Fig. 2

Elton Leme has described the continuing massive destruction of habitat in Brazil. Sam Smith, in reporting his recent collecting trip to Paraguay, said that the orchid *Miltonia flavescens* is not being destroyed by the hundreds or thousands, but by the ton. In a recent article in *The American Orchid Society Bulletin,* Ted Green stated that he has seen blocks of 100 to 1,000 field-collected orchid species offered for sale. He says, "These, of course, are CITES-certified,[1] which makes a joke of the whole program."

It is wrong to put any bromeliads on the endangered species list. I have no easy answers. Many third-world countries are forced to cut rain forests and destroy habitats for the timber and the cattle they will export just to meet interest payments on loans from the International Monetary Fund.

A few of those plant merchants who are most outspoken in favor of conservation are building up large stocks of tillandsias both in Europe and in the United States with the expectation that CITES will be enacted and they will then be able to raise their prices as a result. On the other hand, there are people who believe sincerely that by placing plants on endangered lists they will help to conserve them while they seem to ignore the fact of world deforestation.

Civilization has given man almost complete control over his environment but he is at war with nature and is winning. We ignore our ties with nature and continue to destroy without thinking of the consequences.

Collecting is a minor element when the total problem is put into perspective. In the time it took you to read this article many thousands of epiphytes have been destroyed, as well as animals, trees, and many species of life we shall never know. The problem will be aggravated if the Convention on International Trade in Endangered Species is enacted for bromeliads.

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Alajuela, Costa Rica

[Mr. Skotak adds: "I have traveled extensively in Central America for 15 years and have resided in Costa Rica eight years. I currently operate a bromeliad export business dealing mainly in seedlings and cuttings."]

[1] [Convention on International Trade in Endangered Species.]

Endangered Species, Another View

Mark A. Dimmitt

Dear Tom: The letter by Chester Skotak that you sent me has motivated me to start compiling the work that the Conservation Committee has done since the Code of Conduct was published more than a year ago. We have contacted more than 100 people throughout the world who have experience with bromeliads in the wild, and asked them to assess their status. We received positive responses from about a dozen experts in several countries. The information the committee has requested is tedious to compile and it is slow in coming.

I agree nearly 100% with Mr. Skotak's analysis: that habitat destruction is orders of magnitude more detrimental to bromeliads (and almost all other life on the planet) than is commercial or private collecting. The only thing I disagree with is his interpretation of the intent of the Code of Conduct. The Conservation Committee did not intend to say or imply that bromeliads are in need of legal protection and, in fact, we are opposed to listing the family as a unit under CITES or any other protective law.

I presume that his misinterpretation arises from the Code's admonition to observe and respect all laws and local customs. Whether or not we agree with certain protective laws, a conscientious person abides by them right down to the sentiments of local people.

I learned about local customs the hard way on a collecting trip in Peru. My companion and I stopped on the roadside near a village to collect some *Tillandsia straminea* that were growing abundantly there. We didn't think to ask permission, because we assumed that, as in much of Latin America, the local people referred to all epiphytic plants by one generic name (often "parásitos"), did not distinguish among the species, and had no use for them. On this occasion, however, two women approached us (in itself an auspicious omen, as women there are usually quite shy toward strangers) and expressed concern that we taking their flowers. After a brief conversation, we learned that the people of this area value this bromeliad for the beauty of its inflorescences; they decorate their homes with the bright lavender sprays. I think the women were appeased when we assured them that we also thought they were beautiful and would take only a few for our own gardens, but we were still deeply embarrassed at having offended local sensibilities. It is in attempt to help others avoid committing similar social (and perhaps legal) offenses that we worded the Code of Conduct as carefully as we did.

The reports received by the Conservation Committee from our correspondents so far are all nearly the same in content and tone as Mr. Skotak's letter. Many bromeliads are disappearing, and the cause is almost always habitat

destruction caused by war, timber cutting, agriculture, urban expansion, and other human activities. We should not, as a bromeliad society, overlook the fact that most of the world's tropical plants face the same grim future. When confronted by destruction on so massive a scale, the thought of blanket restrictions on the collection of whole families of plants is, of course, ludicrous. Collecting and introducing into cultivation is the only hope for survival for many of these species.

On the other hand, there are a few areas in Tropical America which are protected, at least in theory, by park or other biological preserve status. Laws are needed to protect the resources in the preserves. Even though enforcement is often a farce, concerned citizens should still support these laws on principle.

To date, the Conservation Committee has identified only a single species that is threatened by collection. *Tillandsia xerographica* of southern Mexico and northern Guatemala is highly desired by collectors and extremely slow growing. Several people report that it is now rare in most of the areas where it was once common. Elton Leme, in a letter, told me that he knows of two species in Brazil that were extirpated by collectors; I am waiting for more concrete information on these. There are undoubtedly more examples, but they seem to be the exceptions to the general rule that most bromeliads are abundant within their habitats. Many conservationists compare bromeliads to orchids and cacti, and this is totally erroneous. Bromeliads are typically much more common. While it is unusual to find more than a dozen or so orchids of a given species in one tree, the same tree often supports hundreds or even thousands of bromeliads of each of five or six species. Most bromeliads are not in danger from collection at the present time, and the Code reflects this: it is somewhat less stringent than the Code of Conduct of the Orchid and Cactus and Succulent Societies.

Lastly, I disagree strongly with Mr. Skotak's assertion that some dealers are promoting CITES listing in order to stop imports and thus secure a monopoly for their businesses. I have known one commercial collector/grower personally for nearly 20 years, and several others well enough to discern their philosophical attitudes. All of them possess a deep and intense, often mystical, love of these plants, which transcends their desire for a profitable business. Not one of these people would collect in such a way as to threaten a wild population. And above all, they realize that an embargo in international trade would eliminate opportunity to introduce new species to horticulture, possibly saving them from extinction in the process. Yes, there are scoundrels as in any field, but they are exceptions and do not justify the censure of the whole group.

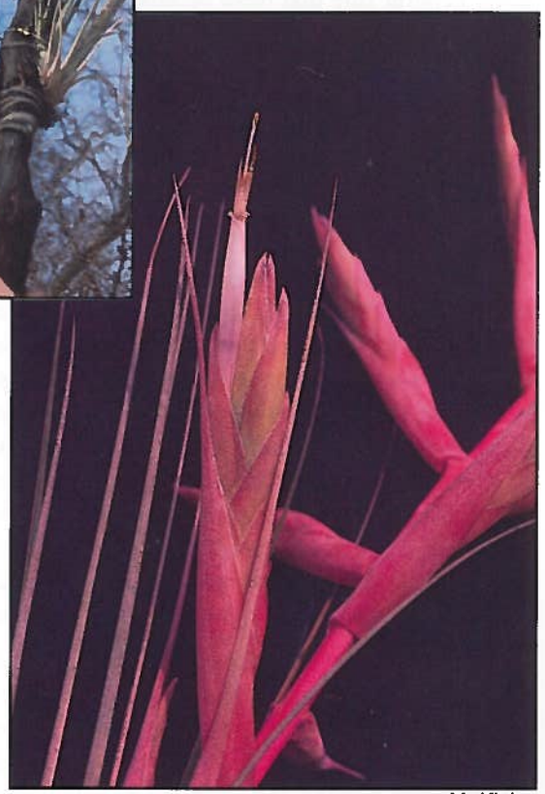
One has only to survey the world's botanical gardens to see the need for more help in preserving endangered species. Very few gardens have the funds to maintain viable populations of more than a handful of species, and there are thousands on the verge of extinction. True, commercial enterprises are likely to carry only the attractive species, but every bit of help is urgently needed. *(con't. on page 175)*

A Remarkable, New, Large Tillandsia from Western Mexico

Walter Till, Heidemarie Halbritter, and Ernst Zecher

E. Vitek

Fig. 3
Habit of the new species, *Tillandsia ilseana.*



M. Kiehn

Fig. 4
A close-up of *T. ilseana* spike and flower.

***Tillandsia ilseana* W. Till, Halbritter & Zecher, sp. nov.**

A *Tillandsia bourgaei* Baker, cui versimiliter affinis, characteribus sequentibus differt: rosulis angustioribus et longioribus, foliis longioribus, bracteis scapi semper inflorescentiam laxam brevioribus, bracteis primariis distincte angustioribus, spicis lanceolatis 3–5 floribus, bracteis florigeris angustioribus sepala longioribus, sepalis glabris (vel subglabris) posticis 8–9 mm connatis et petalis longioribus albis medio pallide violaceo tinctis.

Typus. Mexico. Guerrero: in via Chilpancingo–Chilapa, 1300–1600 m.s.m., epiphytica in quercis, Martius 1980, *E. & I. Zecher s.n.*, 8/80 (holo- et isotypus WU).

Plant flowering 1 m high, stemless, occasionally propagating by axial offshoots at rosette base; *leaves* forming a narrow, erect rosette, narrowly triangular, green but densely covered by white subappressed scales, to 60 cm long; *sheaths* brownish, triangular, 7–8 × 4 cm, merging into the blades; *blades* 2–2.5 cm wide above the sheaths, evenly narrowed into a subulate apex. *Scape* erect or decurved, 8 mm ∅, concealed by the scape bracts, ± as long as the inner rosette leaves; lower *scape bracts* like the inner rosette leaves, the upper ones shorter but surpassing the lower spikes. *Inflorescence* erect or pendent, to 38 cm long and 18 cm in diameter, lax, bipinnately compound of (7–) 9–15 spikes, the rachis rose like the spikes and primary bracts, ± angulate, subdensely white lepidote: *spikes* spreading, longer than the sheaths of the primary bracts but the lower ones surpassed by the blades of the primary bracts, 8–10 × 1.2–1.4 cm, dorsiventrally compressed with the adaxial side flat, the abaxial side rounded, rose, ± greenish towards apex, with 5–6 (–7) sterile bracts (including the prophyll) at base, (1–) 3–4 (–5) flowered, 5–8 stipitate. *Primary bracts* enfolding the abaxial base of the spikes with their sheaths, the sheaths 6–7 cm long, oblong, blades 6.5–1 cm long (decreasing in size from the base of the inflorescence to the top), subulate, much reduced in the upper primary bracts. *Flowers* odorless, very short, stoutly pedicellate, subsessile, strictly erect, appressed to the spike rachis, their bracts densely imbricate at flowering time; *spike rachis* angled, lepidote, green; *floral bracts* lance-ovate, greenish at base, pale rose above, densely white lepidote, carinate, acute, 35–39 × 7–8 mm, distinctly surpassing the sepals. *Sepals* whitish, greenish at base, pale rose at apex (especially along the keel of the posterior ones), ± 28 mm long, acute, posteriorly 8–9 mm connate and carinate, thickened along the keels, glabrous or with a few scales at apex. *Petals* white, very pale violet immediately above the sepals, postflorally brownish, 48–54 mm long, c. 7 mm wide, their tips revolute, corolla throat closed around the filaments. *Filaments* whitish, broadened but flattened towards apex, twisted basally, 53–58 and 57–63 mm long respectively, in two series of unequal length; *anthers* brownish, ± basifixed, 3–4.5 × 1–1.5 mm, *pollen* egg yellow. *Ovary* greenish, conical, 5 × 2.7 mm, placentation in the lower half, *ovules* long

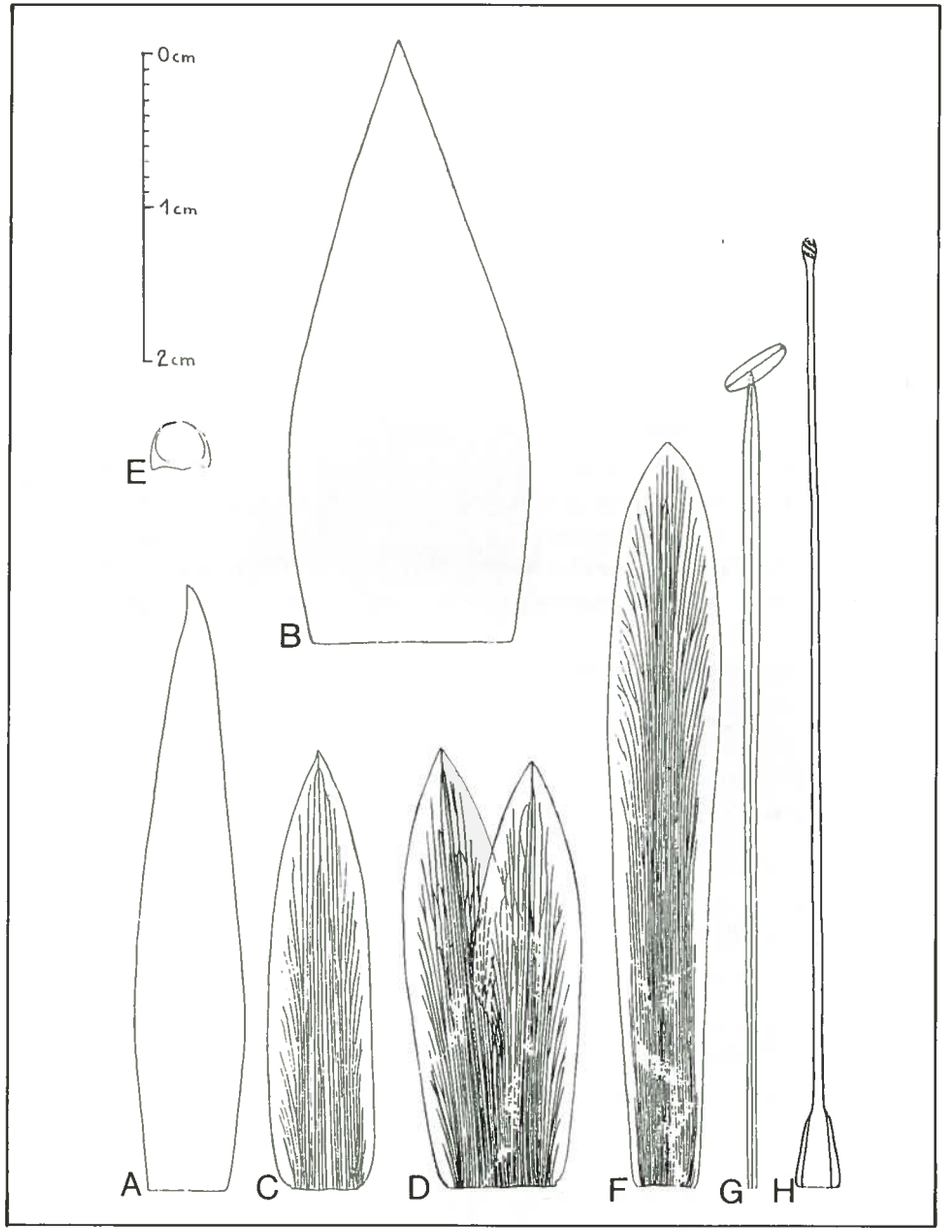
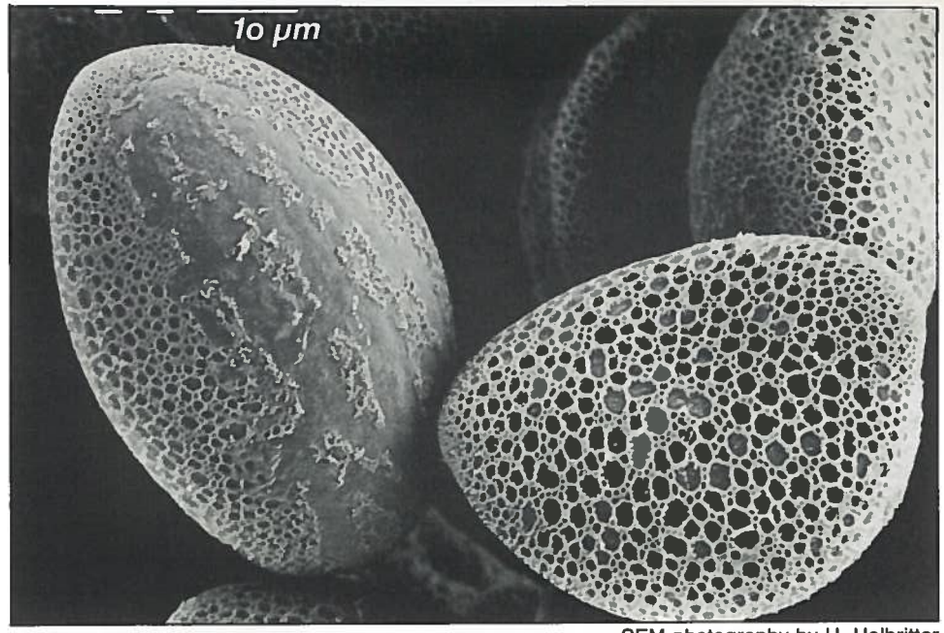


Fig. 5 W. Till

Tillandsia ilseana W. Till, Halbritter & Zechner. A, floral bract, lateral; B, floral bract, flattened, ventral; C, anterior sepal, ventral, with raphides (bundles of needle-like crystals), ecarinate but thickened along the central nerves; D, posterior sepals, ventral, carinate, connate for 8.5 mm, with raphides especially along the central nerves (and here slightly lepidote); E, posterior sepals, section 5 mm above base; F, petal, ventral, with raphides; G, stamen, basally twisted, anthers dorsifixed; H, gynoeceum, stigma with spirally twisted lobes.



SEM photography by H. Halbritter

Fig. 6 Pollen grains of *Tillandsia ilseana.*

caudate; *style* whitish, 55–60 mm long; *stigma* yellowish, representing type II of Brown & Gilmartin (1984) and Schill & al. (1988) respectively, surpassing the longer stamens, 1 mm long, the lobes twisted, with a hyaline tasteless drop of liquor after anthesis. *Fruit* not seen.

Type. Mexico. Guerrero: along the road from Chilpancingo to Chilapa, c. 1300–1600 m a.s., epiphytic on oaks, March 1980, *E. & I. Zecher, s.n.* 8/80, (holo- & isotype WU).

According to Gardner (1986), the new species belongs to group I, subgroup III. Using the Smith & Downs monograph (1977), the plant keys out to *Tillandsia bourgaei* Baker, the nearest related species, but *T. ilseana* differs from *T. bourgaei* in the following characters: broader rosettes, shorter leaves, scape bracts often surpassing the lower inflorescence which is rather dense, broader primary bracts, elliptical and more flowered spikes, shorter and broader floral bracts which are nearly equal to the sepals, lepidote and posteriorly short connate sepals, and shorter yellow-green petals.

Tillandsia ilseana differs from *T. roseospicata* Matuda, state of Mexico, in larger habit, smaller leaf sheaths and narrower blades, an inflorescence with fewer spikes, much shorter primary bracts, in spreading and narrower spikes, narrower floral bracts, posteriorly 8–9 mm high connate sepals, the longer, white petals and stamens and style which are distinctly longer than the corolla.

No congruence has been found with other recently described species from this subgenus.

The pollen grains of *Tillandsia ilseana* (fig. 6) were elongated, heteropolar, monosulcate, and about 60 micrometers in diameter (longest axis). The exine is rather thin and reticulate with meshes of various sizes. Pollen surface, pollen size and the shape of the slender furrow are characters of subgenus *Tillandsia.* It is of special interest that the pollen grains of subgen. *Tillandsia* are very similar to or nearly identical with those of many *Vriesea* species. This observation supports the idea that *Tillandsia* subgen. *Tillandsia* (and most probably subgen. *Allardtia,* too) is more closely related to most *Vriesea* species than to other subgenera of *Tillandsia,* judging from pollen characters. We are aware that this opinion is contrary to that of Schill & al. (1988).

A short comment should be made about the phenology of the new species. In culture, flowering began in the first days of April and ended one month later. In the lowermost two spikes of a 15-spiked inflorescence the first flower appeared in the axil of the eighth bract, in spikes 3–10 in the seventh bract, and in spikes 11–15 in the sixth bract. The first 5–7 bracts of each spike are sterile, the spikes are 8–10 bracteate but 3–5 flowered. The very first flower appeared in the terminal spike, then flowers followed in the two lowest spikes, and finally in the middle spikes. This pattern is more or less repeated by the subsequent flowers. Each flower opened in the early evening and began to fade in the late morning of the next day. In late flowering stages a conspicuous drop of tasteless, colourless liquor appeared at the top of the stigma, obviously to prevent a second pollination.

The new plant is named in honor of Mrs. Ilse Zecher who first recognized this novelty in the field. We thank Dr. E. Vitek and Dr. M. Kiehn, both of the University of Vienna, for providing the colour slides for figures 3 and 4 respectively.

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Corrigenda

Journal, v. 39, no. 3, p. 127, col. 2: Lincoln, Mary Jane. Add symbol ‡ to designate as master judge. We regret the omission.

p. 132. Change drawing identification from *Tillandsia narthecioides* to *T. streptocarpa.*

Neoregelias from Seed to Seed

Arla Rutledge and Harvey Kendall

Neoregelias are probably the most commonly cultivated bromeliad, yet only a relatively small number of growers will bother to attempt to grow these lovely plants from seed. The problem undoubtedly stems not from the growing of the seed, but from the scarcity of harvested seed. Some bromeliads, for example aechmeas, vrieseas, or tillandsias, flaunt their seed before our eyes, and we can hardly miss seeing it. Neoregelias, on the other hand, seem quite reluctant to display and distribute their seed; it develops deep in the cup and has to be sought. Furthermore, unless certain precautions are met, the seed will not develop at all. Fortunately, the steps necessary to obtain seed in neoregelias are not complicated; the method lies easily within the reach of all of us.

POLLINATING

Let us begin at the point where a neoregelia begins to bloom. The actual flower, which may be overlooked since it is small, appears in the cup, and is frequently outshone by a lavish display of color in the leaves. It will be any shade of blue or purple or may be plain white. Some of the flowers are also a blend of two shades of blue. The petals are usually flared at the peak of bloom; some will lie quite flat, while others allow only a narrow peep into their insides. They remain open for only a few hours, beginning at about three hours after sunrise and ending sometime in the mid- or late afternoon. The intensity of the sun plays a role in this flowering period. The flowers open early on sunny mornings. On cloudy days, the flowers may not open fully. Also dependent on the sun is the ripening of the pollen. It, too, does not perform well on cloudy days. Also, high humidity may retard the ripening of the pollen. In southern California, we have noticed that a year in which the summer is more humid than others yields little neoregelia seed. However, if the humidity is accompanied by a lot of air movement, its negative effect is diminished. Growers in the south and southeastern United States, who have their plants outside, should experience no trouble obtaining seed on their neoregelias.

In the native habitats, myriad insects pollinate the neoregelias. In cultivation, however, we cannot rely on this method. Although neoregelias often set seed with no help from us humans, we can increase the probability of seed production greatly by lending a hand. First of all, as the plant begins to bloom, remove all the water from the center of the plant, and keep the center dry until the seed is harvested. When these plants are growing in their native habitats, this dry center is achieved either through drought or through a unique device from Mother Nature: the plant becomes weak-kneed and leans over, dumping any water that might lead to rot or premature germination in the seed. During these months while

you are keeping the center dry, you should not neglect to water the potting medium. Although the roots do not transmit much nutrition to the rest of the plant, they do provide water. The only tool needed to hand pollinate is a small artist's brush; or even a lead pencil will suffice. The flower is receptive to pollination only during the time that the pistil emits a tiny droplet of nectar at its tip. Unless you use a strong magnifying glass, you probably will not be able to see the nectar at all. It appears sometime after the flower opens and lasts only a short time—perhaps no more than fifteen minutes. This period is usually sometime between 9:00 and 11:00 a.m. Therefore, if you are intent on achieving seed set, you should work on the flower several times during the morning hours. The process involves only inserting the brush into the flower and dabbing it around a few times. This tactic should transfer pollen from the stamens to the pistil. If the pollen is ripe, you will see it as a whitish or bright yellow powder on your brush. The pollen remains ripe for a much longer period than does the pistil, so do not think that you can stop as soon as you see pollen on your brush.

Neoregelias produce from one to four (seldom more) flowers per day. The small varieties, such as *N. ampullacea, N.* Fireball, etc., will have only six or eight flowers in all. Other specimens may have ten times that many flowers. In the latter instance, the entire bloom period may extend over a period of a month. You will need to have your mornings free. If not, and if you are a genuine plant lover, you will carry plant and brush with you to the office!

HARVESTING

When the last flower has faded (they appear first at the outer edges and last in the very center of the flower head), you can relax or turn your energies to other pursuits. You need to water the plant's soil only until the seed is ready to harvest. The seed development in neoregelias takes about six months. By the end of five months or perhaps a little sooner, you will be able to ascertain whether your efforts were successful. If seed is on its way, the defunct flower will show a fat, berry-like ovary immediately below the place where the petals were. The berry will be nearly white. In some bromeliad genera, *Aechmea* for instance, the berry will show a definite color change when the seed is ripe. Not so in the neoregelias. But maturity is nevertheless easily determined. If the berry detaches from its pedicel quite easily at the slightest tug, it is ripe. Do not attempt to harvest the seed before it is fully ripe, for you will most probably not have viable seed.

The contents of the ripe berry will be a gelatinous substance around many dark brown seeds about the size of the seeds of a strawberry. For easy handling, you will want to rid the seeds of their sticky jelly. Squeeze them into a closeable jar. Add an inch or two of water and one drop of liquid detergent. Close the lid tightly and shake the contents. Leave the seeds in the jar for 24 hours and shake them as many times as you find convenient during this time. After 24 hours, strain the contents through a very fine mesh. Most tea strainers are not fine enough to

catch the seed. A good strainer can be made from a section of nylon hose stretched over a jar or pan. You may want to run more clear water over the seeds to remove any suds that may be present. Then spread the seeds out on a paper towel, napkin, or even a piece of typing paper. Let them dry for at least a day, then they can be raked easily from the paper into an envelope or other suitable container. Do not store bromeliad seed in a tightly closed glass or plastic container, because they might perish from fungus or premature germination. A paper envelope allows enough air circulation to prevent these problems.

A neoregelia such as *N. carolinae* can produce as many as 2,000 seeds. Not many of us can accommodate that many plants. Therefore, we again urge you to share your good fortune with other members of the Society by sending your surplus to the Seed Fund.

PLANTING

A variety of containers has been used as starter beds for seedlings—plastic pots, margarine tubs, refrigerator dishes, etc. The container should be deep enough to hold at least an inch of soil and leave another inch or more at the top. It is also essential that the container have bottom holes for watering. Overhead watering is sudden death to very young seedlings. Since constant moisture and high humidity are necessary to germinate the seed and get the seedling started on its way, the container should also be enclosed. You may want to use a plastic bag around the whole container and tied at the top. This method, however, makes it difficult to observe the daily progress in the pot. Some growers set several seed pots in an empty glass aquarium and cover it with a pane of glass. A very handy set-up is to use a clear plastic drinking glass as the pot and cover it with a petri dish (available from a hospital supply store). The medium used for sowing the seed must be of a fine texture. Do not use the loose, coarse mix that you might use for adult bromeliads. A good commercial house plant mix containing fine humus and sand is fine. Wet it with only the purest water. Most drinking water contains too many suspended particles of solids for bromeliad seedlings. Bottled spring water or rain water is much purer. Never use softened water. To prevent damping off, you should use a fungicide in the water, such as Benlate, Benomyl or Physan. Other brands may be available in your area. Consult a local nursery for a recommendation. Tamp the soil firmly and sow the seed on the surface. Do not cover the seed with soil. The seed can be sown rather dense, so that the plantlets help in providing humidity for each other as they develop. One authority recommends that the seed be sown thickly enough so that the first set of leaves touches the leaves of its neighbor. However, as long as you are able to maintain a high humidity for your seedlings, a wider spacing is also satisfactory. Using this wider spacing, you can postpone transplanting until the seedlings are more mature. After the seeds are sown, cover the container or enclose it in a plastic bag. Mark the container with a permanent tag showing the date and the name of the plant. You may also want to record the number of seeds sown, in order to study the

viability of the seed. Set the container in a warm place. If you are starting seeds during the winter and your growing area is not heated to at least 65°, you should set the container on a soil heating cable. A very good substitute for this bottom heater is your refrigerator—not the inside, but the top. The refrigerator produces a constant heat from the back. It is ideal for starting seedlings. Neoregelia seed, with a good temperature, germinates in about 10 to 14 days. If the seed is old, or if the temperature is too low, germination will be slower and probably less successful. At about the time of germination, be alert to the possible growth of fungus, moss, or algae on the soil. Growers commonly are harassed by a dense layer of such growth that does not attack the seedling directly, but prevents the movement of water and air through the soil. If you encounter this problem, try to quell it with a fungicide spray in a solution with pure water. Sometimes it becomes necessary to pick off this fungus/algae mat, with probable damage to the seedlings. It is less a problem with these relatively fast growing neoregelias than it is with the slower guzmanias and vrieseas.

Keep a careful watch on the moisture in the soil. If it becomes dry, do not water from above, but set the pot in another container of pure water for the soil to soak up the water from below. You may use a very fine mist from above.

About two weeks after the seeds have germinated, you should begin to use a very weak solution of fertilizer in the watering or misting. Dilute the fertilizer to ¼ the strength recommended by the manufacturer. Apply it no more often than once every two weeks. Continue this care until the plants' second set of leaves is well formed. This is the earliest possible time to consider moving the seedlings from their seed bed. Some growers prefer to wait until the plants are older, claiming that losses are thus reduced. It is probable, however, that the growth of the plants is less severely retarded if they are moved early.

TRANSPLANTING AND FURTHER CARE

When moving the seedlings into a community pot use the same medium and space the plants so that the leaves almost touch. Thus they will retain more humidity. Some growers place them in rows in a flat, others plant them randomly in a ten-inch pot or pony pack. Carefully pick out the seedlings individually with a knife tip or a tweezers and tuck them into their new home. Again, top watering is not advisable; water by setting the pot in a pan of water and by misting. Only after the seedlings have developed new roots and become well established in their new pot, should you water from above. Even with careful attention, you can expect about 10% loss. At this point you should increase the strength of bimonthly fertilizing to no more than ½ the strength recommended by the manufacturer. Leave the seedlings in their community pot until they become clearly crowded. As you move them up into individual pots, you may now use a coarse, porous mix appropriate to adult bromeliads. An example of a good mix is 1 part potting soil, 1 part fine fir bark chips, 1 part perlite (sponge rock). The size of the pot for this

move is debatable. Some growers tell us not to over-pot, others quote a maxim that says: "If you want a big plant, put it in a big pot."

Continue caring for your plants as before. Use half-strength fertilizer twice a month and flush the cups with each watering. Keep the plants in bright light without direct sun and maintain a high humidity around them. Some neoregelias will reward you with full inflorescence and bloom three years after sowing the seed, but most will take four years. The wait may be long, but you will have the satisfaction of knowing that you had a hand in the whole process.

HYBRIDIZING

It is certainly a great thrill to develop a distinctly new plant. This achievement is also within the reach of anyone who has two different neoregelias in bloom at the same time. You will also need a strong magnifying glass, a small scissors, and a small brush.

A neoregelia flower announces its opening on the evening before the grand performance. The petals, still tightly closed, will rise above their neighboring buds. One glance at the center of the plant will tell you which flowers will be open the next day. If you want to cross two species, you must assure that the pollen of the lower does not reach its own pistil before you introduce the pollen of another plant. To achieve this trick, it is necessary to lop off the pollen pads before they ripen, i.e. on the evening before bloom. Pry open the petals, bend them back and snip them off as low as possible. Then use your glass to locate the stamens and the pistil. When you are sure which are which, cut off the stamens. Be ruthless. Let not even one survive. On the next day, when the pistil is receptive and the pollen of the other plant is ripe, use your small artist's brush to transfer pollen from the one plant to the lone pistil of the other. Ideally, this process should be repeated for every flower as the plant progresses through the bloom period. If you are able to perform the operation for only one or a few flowers, then you will want to remove completely all the other flowers that appear. If the cross has been successful, you will get seeds in about six months. Plant them and enjoy their development.

It is possible for these flowers to set seed without actually having been hybridized. Sometimes a flower is triggered into seed production by the mere presence of any pollen without that pollen having transferred chromosomes to the target plant. In this case a cross does not occur. The chances of such an occurrence are slight, and your efforts most probably will result in a hybrid. You will know only when the resulting plants reach maturity.

Pollinating, cross pollinating and growing from seed are not complicated processes. With the little bit of knowledge presented here and a modicum of patience, you can increase your enjoyment of bromeliads many times over.

Reprinted from the Journal, *vol. 27, pages 252-258; 1977.*

Brazilian Reports, Numbers 8, 9, and 10

Elton M.C. Leme

***Aechmea discordiae* Leme.**

According to a report of the trip called "Rio-Bahia-Rio,"[1] on the fourth day of the excursion we collected a species very much related to *Aechmea rubens* (L.B. Smith) L.B. Smith. At the end of our studies, however, we came to the conclusion that we had found a new species that we called *A. discordiae*. The differences between this species and *A. rubens* include: leaf sheaths that are very distinct when compared with the blades, lower primary bracts equaling or exceeding the branches, branches short, pedunculate, and smaller sepals of a different shape. The specific name of this new species indicates the argument that arose among the collectors (E. Leme, A. Menescal, and R. Bello) who could not agree on the identity of the, then freshly collected, specimen.

Growing on the sand in full sun (please see cover photograph), *Aechmea discordiae* can be found in small groups in open spaces on sand dunes. When sterile, it can be mistaken easily for *A. blanchetiana,* which is very common in the area. That is why a more detailed observation could not be made about the pattern of distribution in the area and the size of the population.

***Neoregelia lymaniana* R. Braga & D. Sucre.**

Neoregelia lymaniana R. Braga & D. Sucre[2] was collected originally by Ruby Braga in the State of Rio de Janeiro, Petropólis county, between Itaipava and Teresópolis. According to its collector, the plant was very common where it was picked up. The place was marked by a tract of Atlantic forest that remained on the banks of a creek. In this environment the plant grew epiphytically.

The finding of this unusual bromeliad was important as it proved the existence of a second species belonging to the subgenus *Neoregelia* with compound inflorescence. This characteristic was known previously only in *N. fosteriana* L.B. Smith.

The specimen shown here (fig. 7) was collected by E. Leme in an area ecologically similar to the one of the type, around Correias, Petrópolis County. It is interesting to observe, as did the authors of the species, that the inner leaves of the rosette of *Neoregelia lymaniana,* shortly before anthesis present a transverse band of intense pink. Yet, as the first flowers open, this coloring begins to fade gradually until it disappears. This peculiarity is not observed in any other representatives of *Neoregelia,* which, even after anthesis, go on showing bright colors on their inner leaves.

Fig. 7
Neoregelia lymaniana
R. Braga & D. Sucre 1974.

photos by the author

Fig. 8
Tillandsia reclinata was orignally discovered on a mountain at 1600 m altitude. The author has been trying to reacclimate the plant to sea-level conditions.

Anyway, this species possesses peculiar characteristics such as: the petals remain erect and open very slightly at anthesis, nearly equaling the length of the sepals and presenting a short point at the top. It is quite possible that descendants of the type can be found in cultivation. On the other hand, a new collection of *N. lymaniana* will definitely guarantee its establishment in cultivation and its preservation *ex-situ* and still making possible additional studies and observations.

***Tillandsia reclinata* Pereira & Martinelli.**

Tillandsia reclinata Pereira & Martinelli[3] is a privileged plant as its habitat is an area that is a government park for the preservation of wildlife and environment. It was originally discovered by the botanist and specialist in bromeliads, Gustavo Martinelli, on a mountain about 1600 m high in Araras, Rio de Janeiro. The specific epithet refers to its pendant, creeping habit. It grows on rocks that are frequently enveloped in thick fog.

Because of its small size and gray leaves (fig. 8), this species is difficult to locate from a distance. It cannot be spotted unless one gets very close. It has many characteristics in common with *T. grazielae* Braga & Sucre but differs, according to its authors, in the simple inflorescence and in the heavily imbricated leaves, besides the very habit of the plant.

Cultivation of *Tillandsia reclinata* at sea level in the city of Rio de Janeiro is very difficult. We are now trying to get it firmly fixed on rocks in its typical inverted position. Although we still have not had positive results from this method of cultivation, we think it may work until the plants adjust to our local conditions.

NOTES:

1. Bradea 4:255-256, 1986.
2. Rev. Bras. Biol. 34:491-494; 1974.
3. Bradea 3:253-254; 1982.

Rio de Janeiro, Brazil

BALLOTS FOR THE 1989 ELECTION were supposed to have been mailed with the May–June *Journal* to all members of the California, Florida, International, Louisiana, and Texas regions. Some ballots were not mailed because of an error. Ballots are especially important to FLORIDA and LOUISIANA members because they may vote for only one of two or more candidates while CALIFORNIA and TEXAS have only one candidate each and INTERNATIONAL has two candidates for two vacancies. If you did not receive your ballot, write or call the editor: 1508 Lake Shore Drive, Orlando, FL 32803; telephone 407-896-3722.

Ecuadorian Chronicle

Carol M. Johnson

Collecting trips were planned as special events of the 1988 World Bromeliad Conference in Miami and, although accomplished through a travel agency, were promoted and arranged through the conference. The plan was for trips to Brazil, Ecuador, Guatemala, and Jamaica, but for various reasons only the pre-conference tour to Jamaica and the post-conference tour to Ecuador took place. There were eleven of us in the Ecuador group: eight Americans and three Australians. All are bromeliad growers except one who we kidded about being an undercover agent for the travel agency since she said that this was her 35th tour with them.

This was supposed to be an organized bromeliad collecting trip by bus with an expert plantsman as our guide. It soon became apparent, however, that the plan was for a lot of bus riding with some collecting along the roads. But this was no ordinary group of tourists and we were determined to stop when and if we wanted to. And we did, screaming, "Stop! Stop!" whenever we saw something unusual. Our tour guide was Antonio Torres, a well-educated, English-speaking Ecuadoran who had no idea what a bromeliad was. His specialty is tropical birds and national parks. We educated him and before the trip was over he was carrying home plants for his own yard.

We arrived in Quito on the evening of May 23rd, were met by Señor Torres and transported to Hotel Colon International, our headquarters during our stay in Ecuador. The staff was extremely efficient and obliging, and there were no mix-ups. They stored our collected plants and extra luggage when we went on side trips. Since Quito is 9,200 feet above sea level it soon seemed to me that, at that high altitude, my feet were nailed to the floor. The younger members of the group handled the altitude well but complained of headaches. We all learned quickly that the monetary exchange rate was greatly in our favor.

Tuesday, May 24th was our first outing. We were told to pack a small bag, enough for two nights. Our bus riding began. Starting from the high altitude at Quito, we gradually descended and drove through some pretty scary territory. The roads are usually, but not always, surfaced, two-lane, and with occasional turnouts. They are carved from the mountain sides with no guard rails between the road and the seemingly bottomless void just outside the windows of the bus. Our guide, to reassure us, told us that all buses such as ours are driver-owned and that the state requires drivers to attend training school for three years before being allowed to transport passengers on the highway.

We proceeded from Quito through Latacunga and Ambato to Baños collecting along the roadside on the way. There were many bromeliads: guzmanias, pitcairnias, tillandsias, puyas—all very large plants with beautiful blooms and all unfamiliar to me. This being our first day we collected some of them even though we were above 8,000 feet and knew we were committing planticide. About the middle of the afternoon it began to rain and it would be three days before we would be dry again.

We spent the night in a chalet-type lodge at Baños where the food was indifferent and the beds were very hard. On all my collecting trips I carry a soft warm lap robe (I call it my baby blanket) and it served me well that night.

Wednesday, May 25th. We were up early, took our tetracycline tablets for health, ate another indifferent meal and took off. We were at a much lower altitude and that suited me fine because of the kinds of plants we would probably find and because my energy had returned. Even though it began to rain, we collected at every stop disregarding mud and rain. Wearing bifocals and collecting in the rain is a tough act. It was on this day that my admiration for the Australians in our group began to grow. The rain, the mud, the rough going, the lack of comfort stops, nothing seemed to dull their enthusiasm. They were cheerful, enthusiastic, and determined to collect even though soaking wet.

The bromeliads in this area were more familiar to me and it was a pleasure to find and collect them. The rain let up when we got to Puyo, at the headwaters of

Sam Smith

Fig. 9

Front: Rosalind Casher, Joanne Kick, Carol Johnson, Pat Coutts, Marjory McNamara, Ellen Jay Peyton, Hattie Lou Smith.
Back: Jack Percival, Jerry Raack, David Coutts, Sam Smith.

Sam Smith

Fig. 10

Jerry Raack in the act of collecting a to-be-identified tillandsia.

the Río Napo. Here we left our bus (and our collected, wet bromeliads), and embarked on motorized dugout canoes for an one-hour trip down river to an island where we were lodged in thatched huts for the night. It was a nice idea. It all went wrong. Darkness was falling when we arrived, and we were shown to our huts by flashlight. The thatched huts were well above the ground on pilings and had modern flush toilets and showers. Unfortunately these facilities connected only with the ground directly under us.

Thursday, May 26th. About three o'clock in the morning the rain began again, and not just rain, but downpour. It was still raining at breakfast time and nearly the entire island was under water. Since it showed no sign of abating, we waded back to the dugouts, complete with luggage, and went back up river to our starting place. We had no chance to see the island at all. Sheets of plastic were provided for our cover but we were miserable until we saw the bus and Lucio, our driver. We started back to Quito, taking a different route. We made several collecting stops between raindrops and found the only streptocalyx we were to see on the entire trip. The plants were so full of gigantic, stinging ants that we were forced to leave most them behind. As the day wore on and the rain continued, we began to see its effect on the rivers, waterfalls, and roads.

The rivers became muddy, gushing torrents, and in places water poured down the mountainside and across the road. Our progress slowed, and late afternoon and darkness came on. We were all cold, wet, tired, and hungry, and looking forward to a hot shower and a meal at the Hotel Colon. It was not to be. We stopped.

Ahead was a line of vehicles and Antonio reported that the road was washed out ahead and we could not get through. He hoped there would be a bus on the other side of the washout so that the passengers could swap buses and all proceed to their destinations. We waited for what seemed hours until the road was cleared enough to go through, but a few miles further on we stopped again and were then marooned between two washouts. We waited and waited. I dug into my bag and got out my little blanket, still dry even after the canoe trip. Finally, near midnight, bulldozers and road equipment arrived and cleared the road. We reached the hotel about 3 A.M.

Friday, May 27th. First, we learned that on the previous night the alternator on the bus had gone out and Lucio had driven us all the way back to Quito in the rain with only parking lights.

We were scheduled to leave on an 8 A.M. flight for Cuenca. There had been rumors for days of a transportation strike and this day it began to come true. It was not supposed to affect tour buses, but Antonio was nervous. He also had difficulty getting from his home to the hotel, so we planned to leave at 4 P.M., instead. In the interim, we made a trip to see the monument marking the equator.

We arrived in Cuenca early in the evening and enroute to our hotel stopped at a hat shop and bought Panama hats at amazingly low prices. At our hotel, the La Laguna, we had the best food and service of the entire trip. Here, again, the prices were low.

Saturday, May 28th. This was to be the happiest and most productive collecting day of the whole trip. The day was sunny, dry, and warm. A cross-country bicycle race was in progress so we could not go by the main road but made many stops along a side road. We came upon plantings of *Tillandsia latifolia* where some of the plants had 8–10 foot long stems in size. There were also what I believe are *Guzmania sanguinea* of tremendous size and growing on dry cliffs. Since *G. sanguinea* pups through the center of the plant, we had difficulty getting plants of suitable size to carry home. Then we came to a cliff covered with *Tillandsia tectorum,* many in bloom. *T. disticha* was also plentiful in the area. The only crisis of the day involved getting the only collecting pole available to the group hung up on a cliffside. Our agile, younger members finally retrieved it and we proceeded, only to discover that for probably the next 8–10 miles the cliffs were covered in solid masses of *T. tectorum.* Altitude in this area was probably 3,500 feet. The weather was dry, bromeliads were plentiful, and it was a great day all around.

Sunday, May 29th. This was also an interesting day, although we found no new plants. Our first stop was at a little out-of-the-way town where we shopped for gold. Here I bought an 18-carat chain, thanks to the rate of exchange.

After much maneuvering via back roads (turns on the main entrance would not accommodate a bus) we stopped for lunch at Uzupod. This is a resort hotel and a most amazing place. It is surrounded by bare countryside, there are no towns nearby, and it pops up like a mirage out of nowhere. It had everything: a large swimming pool, tennis and shuffleboard courts, a golf course, terraced lawns, all in beautiful shape. I did notice that the landscaping contained very little tropical material, being mostly petunias, marigolds, phlox, and other northern hemisphere plants. I suppose they are exotic to Ecuadorans. We returned to Cuenca for a flight back to Quito that evening.

Monday, Tuesday, May 30-31. We again parked our bags and plants at Hotel Colon and departed for a two-night stay at Tinlandia. I have learned more about that area since returning to Florida than we were told while there. It appears that Tinlandia is an isolated ecosystem with over 50 species of bromeliads growing on the property. The food there was just barely edible and we had to fight the flies for each mouthful as the dining room was roofed but not screened. We were transported by station wagon up a steep incline to the lodging portion of the establishment, under a sluice that poured water over the road. We were told that was to keep the cows off the golf course. Sure enough, there was a beautiful, well-kept golf course, no golfers, just a few cows, but it was in good shape and the groundkeepers were busy.

Along the path bordering the golf course we found several aechmeas, *Neoregelia mooreana, Guzmania lingulata,* and, of course, *Catopsis.* Most of our group crossed the green and followed a road that bore to the right. There were many fallen trees and debris clogging the ravines. There were bromeliads but nothing unusual. There was an abundance of aroids and ginger, all of tremendous size. Since returning home I have been told that we should have stayed in the area adjacent to the hotel as that is where all the bromeliads are to be found. I have also learned that Tinlandia is a must for botanists visiting Ecuador because of its unique ecosystem. I learned also that it is the most expensive hotel in Ecuador.

On Tuesday morning, our whole group rebelled and demanded that we return to Quito instead of staying one more night. Our plants were stacking up in the hotel and we had been given no opportunity to trim and clean them for entry into the United States.

We returned to Quito to find the city in turmoil. The transportation strike was in full swing. Demonstrators were blocking downtown thoroughfares and the police were there doing whatever police do in such a situation with a lot of tear gas and noise.

Wednesday, June 1st. We returned to Miami by way of Guayaquil. Antonio told us that the planes did not fuel in Quito as it is difficult to get airborne at 9,200 feet when heavily loaded. Therefore, all made outgoing stops at Guyaquil. We

arrived in Miami early in the afternoon. I collected my plants from the Department of Agriculture the next day and drove home. My plants had to undergo greenhouse fumigation, but that suited me since then I did not need to impose my own quarantine.

You may have noticed that I have made little mention of the bromeliads collected. This is because it will probably be two years before the survivors bloom and can be identified. It was unfortunate that the plants were brought back to suffer through our hot Florida summer, but my survival rate has been quite good. *Aechmea zebrina* is coming into bloom now. We collected plenty of *Tillandsia tectorum, disticha, latifolia,* and *mima.* Many guzmanias remain to be identified.

Ecuador is a beautiful country. Many of the mountains are stripped of trees, but the whole country is green and there is plenty of wilderness to go around. Rivers and waterfalls are numerous. While the name Ecuador suggests tropical heat, the altitude keeps it cool and we wore trousers, socks, boots, and sweaters every day.

It is important when traveling in Ecuador to drink only mineral water, to take tetracycline to ward off infection, and to avoid drinking milk. Our guide told us that, should we make an independent trip, it would be advisable to rent a car and a bilingual driver. Car rental fees are very reasonable but insurance rates cost more than the driver. If I ever go again I will make my headquarters at Quenca and collect from there.

It was a pleasure to travel with this group. Everyone shared, everyone was polite, considerate, and cooperative. We complained about the lack of planning but we had our share of high adventure and made it home safe and sound.

Longwood, Florida

BACK ISSUES OF *THE BROMELIAD SOCIETY BULLETIN* are still available (see page 69, March-April 1989 *Journal*): a. Many copies of volumes 1–5 (1951–1955) complete with only two or three xerox replacements for originals, with index; b. a few copies of volumes 6–8 (1956–1958) but with several xerox fillers. $10.00 per volume plus postage.

We have a number of separate issues of *Bulletin* volumes 1–8 (not all issues) at $2.25 each postpaid to United States, Canada, and Mexico; $2.30 surface mail to other countries, for airmail add 70¢. Write or call the editor for details: 1508 Lake Shore Drive, Orlando, FL 32803. 407-896-3722.

This notice supersedes all earlier notices on this subject.

2 May 1989.

BIC Observes 10th Anniversary

Harry E. Luther

Much of the research emphasis at the Marie Selby Botanical Gardens in Sarasota, Florida, has been the taxonomy of tropical plants. Taxonomy is the science (some say art) of the proper naming and classifying of organisms. This is a very basic field of study, without which scientists and laymen would have a great deal of difficulty communicating. Standardized names and a natural ordering of related groups of organisms are the goals of the taxonomists. These goals are often difficult to achieve with poorly known plants and animals, and changes are bound to occur as more information becomes available. Names and classifications are not necessarily static; they reflect the state of knowledge at a given time as well as the competency of the taxonomist.

The two identification centers at the Selby Botanical Gardens are the Orchid Identification Center (OIC) and the Mulford B. Foster Bromeliad Identification Center (BIC). These centers were established early in the development of the Gardens as a service to horticulturists, botanists and other interested parties who had need for accurate and reasonably rapid identifications for a particular plant.

The *Journal of the Bromeliad Society* for March-April 1979 contains a summary of the establishment of the BIC.

> When Dr. Lyman B. Smith announced his retirement from the Smithsonian Institution, the question as to who could assist in the identification of bromeliad species arose. At first, the society had selected a California location for an identification center, but when Ervin Wurthmann and Victoria Padilla visited the Selby Gardens in February 1978, they were convinced that here was the ideal place for such an undertaking. The Board of Directors at their meeting in May 1978, agreed with the suggestion, the idea for the California center was dropped, and plans were made to open negotiations with Selby. These were expedited by Bert Foster, who, upon the death of his father, Mulford B. Foster, started a memorial fund in his honor, the proceeds from which were to go the Bromeliad Identification Center at Selby. It was Dr. Dodson who recommended that the center be named the Mulford B. Foster Bromeliad Identification Center, especially appropriate in view of the late Foster's renown in Florida.

When I began as Director in the fall of 1978, the resources available for the study of bromeliads were rather limited. The herbarium contained less than one hundred dried specimens. The library, although very strong for orchids, had few works useful for identifying bromeliads. An extensive file system for all the genera and species in the family was nonexistent. The first few years were spent building the reference base, no small task considering the number of species published over the last couple of centuries. In addition to publications,

photographs of type and other critical specimens from many of the world's herbaria were acquired. This process continues today; the pile of "to be filed" seems never to diminish. This reflects the continuing interest in the family; each year several dozen new species are proposed and all of these publications must be secured and incorporated into the file systems, which now exceeds 3,000 folders.

The herbarium now contains over 2,000 dried specimens including types (the single specimen which every taxonomist cites as a basis for a name, a standard for each new species) and other important collections. The herbarium is particularly important for the bromeliads of the northern Andes, reflecting past and present research interests of the staff and other collaborators. Lesser collections for all regions from which bromeliads are known are also available. The bromeliad herbarium at the BIC has become an important world resource in addition to supporting my own studies.

The ever-increasing living collection of bromeliads at the Marie Selby Botanical Gardens is an important resource. Few institutions have available an extensive, well-documented collection of living bromeliads; this collection is an important source of information for the study of bromeliad anatomy, physiology, cytology and taxonomy. Many new avenues of research require fresh or living material and our collections are extremely valuable in filling these needs. In addition, a number of ornamental bromeliads have been introduced into cultivation as a spinoff of our field collection.

Although the BIC was established primarily to provide for cultivated plants, the activities of the center have been broadened over the years. A treatment of *Bromeliaceae of Ecuador,* with Dr. A. J. Gilmartin, is in progress. The family for the *Vascular Flora of Costa Rica* is planned with Dr. W. J. Kress. Monographic treatments of several horticulturally important groups of species within the genera *Tillandsia* and *Aechmea* are also in progress. All of these studies are long-term projects in nature and rely heavily on an extensive reference base accumulated over the first ten years of operation.

The study of bromeliads, as well as other groups of tropical plants, has accelerated in the past 10–20 years. The increased interest has in part been sparked by the improved accessibility of tropical forests; new road systems have opened to botanists large regions that were totally isolated just a few years ago.

But improved access brings increased and accelerating destruction to these regions that have just begun to be studied. Field collectors often must race the bulldozers and clear cutters to sample the forests before they are destroyed. A recent estimate of tropical deforestation world-wide is 50 acres per minute, a tremendous loss considering the limited number of scientists available to study these forests. Undoubtedly, many species of bromeliads will become extinct before they are even discovered, named, and classified or introduced to cultivation. Epiphytes, including bromeliads, are especially dependent on intact forest ecosystems and are especially vulnerable to habitat disruption.

The stream of new species to be studied may soon diminish and end, not because we have finally discovered them all, but because we have finally destroyed all that are left to be discovered.

Reprinted by permission of the author from Selby Gardens Bulletin *15:2; winter 1988-1989.*

Sarasota, Florida

An Addition to the Genus *Pepinia*

Harry E. Luther

The reestablishment of the genus *Pepinia* Brongniart ex André (Varadarajan & Gilmartin, 1988)[1] appears to be a logical and natural step toward a better understanding of the relationships within the subfamily Pitcairnioideae. The following Panamanian species first described as a species of *Pitcairnia* is therefore transferred to *Pepinia.*

***Pepinia hammelii* (Luther) Luther, comb. nov.**

Pitcairnia hammelii Luther, Journal of the Bromeliad Society 37(3):128-129; 1987. (SEL, holotype).

NOTE:

1. G.S. Varadarajan, A.J. Gilmartin. Taxonomic Realignments within the subfamily Pitcairnioideae (Bromeliaceae). Syst. Bot. 13:294-299; 1988.

Research Grant Availability
Wanted: Meritorious Projects for Support
By the Victoria Padilla Memorial Research Fund

David H. Benzing

Most readers have probably seen previous notices advertising the availability of modest research grants to pursue worthwhile inquiries on bromeliads. We hope that you haven't failed to apply for the wrong reasons. Potential investigators certainly don't need university degrees! Much useful information has been gathered by serious amateurs pursuing good questions carefully. There is no shortage of challenging problems on culture and propagation—in fact the possibilities are enormous.

There are, of course, some rules and expectations including a report of findings suitable for publication in this *Journal.* The granting committee also wants to see a clear statement of the problem and the intended methods of investigation. What questions do you plan to ask and how do you intend to test the possibilities? How will you spend the funds? What, if any, materials will be purchased? Is travel involved? What is the planned timetable?

If you have an idea let the committee know. We'll do our best to provide useful comments.

Department of Biology, Oberlin College, Oberlin, Ohio 44074

How to Prepare a Bromeliad Specimen for Identification by the BIC

Harry E. Luther

A. If the flowering plant is small and you have a plant to spare, send the entire plant.

B. If the plant is large and bulky or you do not wish to send the entire plant, you must include two complete leaves with leaf sheaths and the inflorescence including the scape.

C. Give as much information about the origin of the plant as possible. If wild collected, please provide the following data:

1. country
2. province or state
3. habitat
4. elevation

D. A photograph or drawing of the plant is often helpful but **cannot** substitute for an actual specimen.

E. Describe any features not apparent on the specimen such as corolla and calyx color, whether or not it is stoloniferous, height and diameter, etc.

F. Please send $5.00 to help cover the expenses of determination.

G. Specimens should be sent by air to:

BIC, Harry E. Luther
Marie Selby Botanical Gardens
811 South Palm Avenue
Sarasota, Florida 34236 USA

H. With few exceptions, it is impossible to identify hybrid bromeliads with any degree of certainty.

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

Note to Contributors

Please send material proposed for publication in a specific issue of the *Journal* at least 60 days before the mailing date, which is usually the next-to-the last Monday of the preceding month. We cannot promise that show calendar notices, ads, or any other material will be included if received after the closing date.

Pictures for articles must be Kodachrome 35 mm slides, glossy black and white prints, or black and white drawings. The color lab that makes the color separations cannot mix Ektachrome, Fujichrome, or other kinds of film with Kodachrome without charging a great deal more money (no criticism of the film implied). We cannot use color prints because of the extra cost and possibility of poor color reproduction. A release to copy all illustrative material for BSI purposes should accompany the material.

All copy should be typewritten and double spaced to reduce the chance of error.

Address any questions concerning material to the editor. There is a continuing need for contributions, 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

Endangered Species, Another View *(con't. from page 151)*

The Conservation Committee members concur with these statements. It is our opinion that the vast majority of bromeliads are not in need of protection from collecting at the present time. Many are or soon will be endangered, however, by the global habitat destruction taking place in the tropics. We are actively seeking more information, from quantitative to anecdotal, on the status of any and all wild bromeliad populations. We encourage anyone with such knowledge to share it with the committee and the society.

Sincerely,

Mark A. Dimmitt
The Arizona-Sonora Desert Museum,
2021 N. Kinney Road, Tuscon, AZ 85743

Chairman, Conservation Committee
The Bromeliad Society, Inc.

The Bromeliads: Genera–Species–Hybrids (Concluded)

Louis Dutrie

[We began publishing the English translation of Louis Dutrie's report on bromeliads with the September-October 1987 issue of the Journal *and now conclude with what were, originally, the ninth and tenth installments in* Le Bulletin Horticole *of July 1947 and January 1948. As with the original, it has taken some time to complete this presentation. During the 40 years since M. Dutrie wrote, generations have discovered bromeliads. We hope that they will read his words and remember his work.* –Ed.]

THE CHOICE OF PARENTS

The obvious goal of the horticulturist in making crossings between genera and species is the creation of hybrids that are superior in quality and in beauty to those of the parents, or that present new characteristics of form or of color.

If the offspring were always intermediate in size and color between the two parents, the results would be easy to predict. A large species with red flowers crossed with a smaller one with yellow flowers should give a medium-sized plant with orange or bicolored flowers. It is far from being thus and one cannot predict with exactitude the results of such and such a hybridization.

There are divided opinions on the role played by the parents and their influence on their descendants. Some botanists (Koelreuter, Gaertner, and others) estimate that the power of the male and female elements is entirely equal. According to others (Focke and Bailey), the more virile parent, whether it be one sex or the other, has the dominant influence. Some practitioners attribute a preponderant influence to one or the other: *to the father* form and color, and *to the mother* constitution and vigor proceed to cite numerous examples in support of their thesis. Other growers have cited fully as many in contradiction.

In reality, every hybridization brings surprises. It is probable that the transmission of characteristics is an individual quality.

Experience teaches, however, that variegation of foliage is not transmitted to hybrids if it is white, and never other than very attenuated if it consists of bands or marbling. The brown coloration of leaves is transmitted rather frequently but with a tendency to become weaker with each generation.

Among the descendants of *Aechmea fasciata* × *A. lindenii*, of *A. fulgens* (or *A. fulgens* var. *discolor)* × *A. fasciata,* and of *Androlepis skinneri* × *A. fasciata,* the dominant influence of *A. fasciata* becomes apparent in the form and the color

of the inflorescences. With *A. fulgens* var. *discolor* × *A . lindenii,* the plant has the appearance of *A. lindenii* and the coloration of the leaves of *A. fulgens* var. *discolor,* red-brown on the underside, glossy green above. As for the inflorescence, its general form is that of *A. lindenii* but the spikes are longer and red, as opposed to yellow in *lindenii. Fulgens discolor* dominates in the colors, *lindenii* in the forms. *[The author continues with several other examples.]*

Among the vrieseas, certain species (or hybrids) transmit more faithfully than others to their offspring the color of their bracts. Such are those of the group *brachystachys* and *V.* Rex Duval, *cardinalis* and Mephisto with single spike, and among those with branched floral stem, *V.* Polonia, *vigeri,* and *vigeri* var. *major.*

Thus, *Vriesea lubbersii,* with green bracts, fertilized by *V.* Mephisto, with dark red bracts, has produced hybrids colored like the male parent, indeed, almost black *(V.* Africain). The same *V. lubbersii* fertilized by *V.* Rex Hort. Leod., with red bracts, produced nothing of value, proof of the greater virility of *V.* Mephisto. Another species with green bracts, *V. rodigasiana,* fertilized by *V.* Rex Duval produced *V. vigeri,* bright red.

It is evident that if one seeks to obtain hybrids with a branched floral stem one does not ask for it from parents with a single stem.

One accepts as parents only those specimens that are perfectly healthy and vigorous. Every plant with blemished leaves, or leaves spotted with yellow, or misshapen, or malformed, must be ruthlessly rejected just as one would reject every puny or yellowed specimen in cultivation.

THE PRACTICE OF HYBRIDIZATION

Plants that one plans on hybridizing among themselves should be placed several weeks at least in the same conditions of temperature and shade; the latter should be a little less dense than is the case with culture in general. One should however, beware of overdoing it, a frequent cause of failure. Forenoon seems better suited than midday or afternoon for the fertilizing. The mother plants should be placed on a table on the east side of a north–south facing greenhouse and one a south table if facing east–west.

One should make sure at first that the pollen is in a fine powder. It is put on the stamens with the aid of a very small watercolor brush or by means of a sliver of bamboo, 5 or 6 mm in diameter, sharpened to a bevel and to a diameter of 1 mm at one end, and it is then deposited delicately on the stigma of the flower to be fertilized. If they are in sufficient numbers, one can try to fertilize some of them on the same style after having removed the stigma and the aid of a sharp scalpel and dried the wound with blotting paper. One should take care in this case to mark with a special sign the flowers thus fertilized in order to be able in the course of time to compare the results.

Self-fertilization of *Vriesea hieroglyphica* succeeds better if the operation is made in the early morning.

While I am in a confidential mood, I am going to tell you a great secret (do not, especially, shout it from the rooftops). If you want to succeed in fertilizing aechmeas of the *fulgens* group, do not wait until the flower is completely open; it would be too late. Instead, as soon as you see that the petals that form a dome above the sexual organs of the flower become unglued and leave between and above them a little opening, remove them with the point of your bamboo sliver and go to it.

Every time you fertilize two species between themselves, profit by the occasion to do it two ways, each species playing in turn the role of male or female. You thus double your chances of success.

THE FERTILITY OF HYBRIDS

There are still the fertile bigeneric hybrids. In a general way, one could class these hybrids as much as bigenerics as bispecifics, in two categories:

(a) Those to which one of the parents has imparted its own characteristics.

EXAMPLES:

• *Neoregelia marechalii* × *Aechmea fasciata;* the hybrid with all the exterior characteristics of neoregelia, only different in that the peduncle is a little longer, and the lack of coloration of the center leaves proves that, indeed, there has been a crossing.

• *Guzmania lingulata* var. *splendens* × *Vriesea;* the hybrid has, with one exception, all the characteristics of the vrieseas; the exception confirms the crossing as well as the rest by the coloration of the foliage.

• *Vriesea incurvata* × *Guzmania zahnii,* the same observation.

Among the bispecific hybrids: *Aechmea fulgens* × *A. fulgens* var. *discolor* produced plants that were very similar to one or the other parent. The offspring of *A. fulgens* × *A. candida* were, to all appearances, those of *A. candida. A. fulgens* var. *discolor* × *A. ramosa* produced a form like *A. ramosa,* but smaller, with the same branched inflorescence with yellow fruit.

All these hybrids are fertile.

(b) Hybrids that differ strongly from the parents or take as much from one as from the other.

EXAMPLES:

• *Guzmania* "thyrsoides." As a plant, intermediate between the two parents, differing completely from both by the inflorescence.

• *Androlepis skinneri* × *A. fasciata* or *A. fulgens* var. *discolor,* differing as a plant and as to the flower from the two parents.

Among the bispecifics: *Aechmea fulgens* var. *discolor* × *A. fasciata, A. fulgens* var. *discolor* × *A. chantinii, A. chantinii* × *A. fasciata* produced plants quite different from the parents. All are sterile.

It is more difficult to judge the hybridizations between the "Nidularinees," *Neoregelia* and *Nidularium* being very similar. Let us note, however, that *Neoregelia marechalii* × *Nidularium rutilans (N.* Casimir Morobé) is sterile, as are both *N. chantrieri* and *N.* Mme. R. Morobé, both products of *N. fulgens* × *N. innocentii.* It is true that the two latter species produce few seeds, and do not reproduce faithfully from seed. On the other hand. *N.* François Spae, from *N. striatum* × *N. fulgens,* which has foliage similar to that of *N. fulgens* and an inflorescence like that of *N. striatum,* is fertile, while that of *N.* François Spae × *N. innocentii* gives hybrids that are sterile.

All neoregelia hybrids are sterile. From the contradictions offered by the "Nidularinees," and which are not perhaps apparent, it seems that one could draw from these examples the following conclusions:

1. Whenever the hybrid is very similar to one of the parents, it is fertile.

2. Whenever it unites the characteristics of the two parents, or if it is, on the contrary, very different from the two of them, bigeneric or bispecific, it is sterile.

In the first case, there has been simply an influence or light impregnation which did not, in reality, produce a hybrid, but only a variety of the species of the more virile parent.

In the second, there has been a real fusion of the two genera or species in which the influence should be visibly equal and balanced. The hybrid should then be a true mule, hence the sterility.

These are propositions only. They belong to the botanists to confirm or disprove with exactitude, and to light our lantern.

CULTURE OF BROMELIADS

The culture of bromeliads is not difficult or hard. One can sow seed in all seasons. One should choose seeds that are fresh and have not lost their viability.

The seed of species having an inferior ovary, *Aechmea, Billbergia, Nidularium* are bathed in a viscous mucilage from which they should be freed by washing in lukewarm water. Afterwards, they should be dried by being spread out on a sheet of paper. They can then be sown, well separated from one another. They should not be allowed to remain in the humid atmosphere of the hothouse because they will tend to stick together again.

Seeds of *Tillandsia* are provided with a silken plume that is more bothersome than the seed itself. If the seeds are sown with these plumes attached, when the time comes for the first transplanting, the plumes will become entangled and cling to one another making it very difficult to separate the plantlets, which cannot be done without waste. For this reason it is recommended that the plumes be cut off before sowing. This is obviously a work of patience—one could cut approximately 600 per hour—but to unravel the entangled plumes is a painstaking and tiring job.

The seeds are placed on a bed of finely sifted oak leaves, or better, on fresh peat, in earthen dishes covered with a sheet of glass and then put under a window sash frame on the bench of a warm greenhouse. . . A temperature of about 25 degrees C (77 degrees F) is favorable, but the dishes can also be well placed on suspended shelves and if the temperature of the greenhouse is good, the dishes may be left uncovered.

The humidity of the dishes should be kept moderate and as unvaried as possible. A mist spray should be used in the beginning in order not to displace the seed, or, the dish can be immersed about half way in water. The temperature of the water should never be lower than that of the greenhouse.

When the plantlets have two small leaves, one goes ahead with the first transplanting in vegetable mold, or compost, of which the upper portion has been finely sifted. The transplantings that follow allow the use of a planting mixture more and more fibrous. Frequent transplantings stimulate growth. When the plants have reached a height of 5 or 6 cm (2–2½ in), they can be transplanted to small pots or in open soil on suspended shelves. Culture in soil seems to accelerate growth; it is, however, not without inconvenience as it takes more space in the beginning for the plants must be able to develop without being transplanted for at least a few months and must be spaced accordingly. The plants in pots must be closer together at first and spaced afterwards in accordance with their development, never taking more space than is strictly necessary. On the other hand, the final potting must be done at least six months before the presumed date of their flowering in order that the plant may at that time be perfectly rooted in its pot. The change from open planting to the pot is not done without some trouble and slackening of growth, which might not be favorable to the development of the inflorescence.

I have been able, after various attempts, to learn that *Aechmea fasciata,* if left too long in full soil, will develop flower heads much less voluminous than those of plants grown in pots. I favor culture in full soil but only up to the moment when the plant has reached a maximum of half its development, then transferring to pots with frequent repottings, increasing the diameter of the pot only a little each time in order that the last may be of a reasonable size. A strong *Aechmea fasciata* can be grown in a 13-cm (5-in) pot.

The pots can be placed on the bench in cinders, or on a tarpaulin, or buried up to the rim in a bed of peat or linen waste. The latter should be the coarse, rough waste of decortication that does not heat up or decompose as rapidly as the fine waste of spinning mills. A light, mild bottom heat [20–25 degrees C (68–77 degrees F)] is then necessary.

If you wish to stimulate growth, add 50 grams of sulphate of potash and 120 grams of superphosphate per 35–40 kilograms (77–88 lbs) of transplanting soil. . . .

[After a somewhat lengthy review of his earlier descriptions of how bromeliads may be displayed, and the fickleness of public interest, the author restates his introductory thesis.]

There is then the task, a fine chore, offered to horticulturists worthy of the name, who are something more than merchandisers of plants, who love plants for themselves, and to whom the acqusition and, above all, the production of a "novelty" gives more joy than a check in the mail. I would not advise anyone to push disinterestedness to the point where the love of plants brought the great Leon Duval. He sacrificed his fortune, earning the severe criticism of some and the understanding and admiration of others, of whom I am one. But I shall say willingly to those who feel the urge to do research: do not hesitate to spend whatever is necessary to acquire a small collection of bromeliads and at the first opportunity get to work. You will not miss your money and you will have great joy in store for yourself.

Above all else, do not fear having to wait long years for the fruits of your labors. It is not polite to speak too much of one's self, but here is an example, perhaps useful: I began my hybridizations in 1935; you have been able to see the results obtained since 1938 and what I have been able to achieve in less than a decade.

Melle, 24 June 1946

Calendar of Shows *(continued from back cover)*

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.

The Excitement of World Conferences

Odean Head

Have you ever attended a BSI World Conference? My first was the 1977 World Conference in New Orleans. They are very exciting to me and I have not missed one since.

Each conference is unique but they all have similarities. There are always more things to do and see than you have time for and the uniqueness will depend on each person's interests.

Some of the most memorable events I remember are:

- 1977—New Orleans. The impressive garden tours, boat ride on the Mississippi and the colorful neoregelias. This is where I got hooked on neos.
- 1980—Orlando. The beautiful setting, visit to Bromel-La and my first exposure to commercial growers.
- 1982—Corpus Christi. The immense show area and the beautiful society and commercial displays.
- 1984—Los Angeles. More splendid garden tours including the Huntington Gardens. Also exciting visits to more commercial growers.
- 1986—New Orleans. ONE MO' TIME. The beautiful art work of Morris Henry Hobbs displayed in the Presbytère on Jackson Square in the French Quarter, Mary Wisdom's garden, and another boat ride down the Mississippi.
- 1988—Miami. Very unusual show display with entries placed in a natural environment. Tours of Fairchild Gardens, Parrot Jungle, the Everglades, and the Keys.

These things have more than made my attendance worthwhile. However, some of my most overwhelming and enjoyable memories apply to all the conferences. For instance, I have not attended one conference that did not have a beautiful show including some very desirable plants that I have never seen before. Fortunately, there were always some of these available in the sales area. Possibly the most important to me are the lovely people that I have met from around the world and the friends that I have made. There seems to be a very close fellowship among all the bromeliad lovers of the world that adds a special atmosphere to the entire conference.

It is not easy to fully express how memorable these conferences have been to me. I will say that I am more excited about the next one than any of the others. You see, this is our opportunity to invite you to come to see us. We are excited in our planning of all the things we have available to see and do and are anxious for you to share them with us.

We will make an all-out effort to maintain the conference tradition by hosting a beautiful show (we hope the best ever) complete with plants that you have never seen before. The Bromeliad Society/Houston and the Southwest Bromeliad Guild will be your hosts.

You will love the novel site that we have selected. It has great accommodations and we were successful in negotiating reasonable room rates. It is the Wyndham Greenspoint Hotel and the official conference dates are June 6 through June 10, 1990. You may want to come early and stay late to enjoy all the available opportunities.

Considering all the 'See you in Houston' farewells in Miami, we are expecting a good attendance. It seems that we are members of a very large "Excited about World Conferences" support group that is growing. We hope to provide fellowship activities that will add another segment to this group.

We want to improve the fellowship activities of the conference. There never seem to be enough time or opportunities to get better acquainted. The fast pace established by full schedules limits the time and interests of these activities. We want to try a "Worldwide Show and Tell." This will give everyone a chance to see plants and collections they could not see otherwise, and at the same time meet and get to know more about growers around the world.

If you have individual plants or a collection that you are proud of we want you to bring slides to share. We will schedule sufficient presentations to accommodate the participation. You may make your own presentation or we will have someone do it from your commentary.

We will add our touch to the seminars, banquet, sales, rare plant auction, garden tours, entertainment and hospitality services to visitors. We are also considering tours of the Johnson Space Center, Mercer Arboretum, Astrodome, and other points of interest.

Plans are being made for post-conference collecting trips to Brazil, Costa Rica, and Ecuador. There will also be several post-conference garden tours available. Special rates have been arranged with American Airlines, the official conference airline.

We are ready to receive your registrations for the 1990 World Conference. Registration forms are enclosed. Be sure to take advantage of the early registration rates and start making your plans because we want ya'll to come, ya' hear.

Houston, Texas

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. Please, what are all of the recognized varieties and cultivars of *Aechmea* Foster's Favorite?

A. *Aechmea* Foster's Favorite is a hybrid *(Aechmea racinae* × *Aechmea victoriana* var. *discolor)* made by Mulford Foster in 1948. There are no recognized varieties or cultivars. There are, as with all hybrids, probably a number of different clones, but designations of clones are not officially recognized individually.

Unfortunately, there are those who find they have a plant slightly different—leaf color slightly darker, leaf broader or narrower—than another plant of the same name and they are inclined to attach a varietal or cultivar name to such plants. These are natural differences within the same hybrid. If you check a copy of the *International Checklist of Bromeliad Hybrids* published by the Bromeliad Society, Inc., you will find this plant listed.

Q. I have two small *Cryptanthus* 'Pink Starlite' plants. They are each in a pot. Can I put them together?

A. Yes, the plants can be potted together. It is usually a matter of personal choice as to whether to grow only one plant in a pot or have a group of plants in one pot. If there are a number of plants growing quite closely, sometimes they will become malformed from being crowded.

Q. I cannot get my *Cryptanthus* 'Starlite' to turn pink. I would like them to be a deep pink. Is there one I can purchase that would stay pink?

A. Your problem is lack of proper light in your growing conditions. The majority of cryptanthus, and this one in particular, require very strong light in order to maintain the deep color you are requesting. I do not mean direct sunlight, because it can cause burn or fading of color. In my experience, strong light or strong reflected light have produced the best results.

Q. Is it necessary to have a greenhouse in order to grow bromeliads from seed?

A. No, I have grown them for years and do not have a greenhouse. A light table is very convenient, but they can be grown without even that. If you would like further information, please write for more information.

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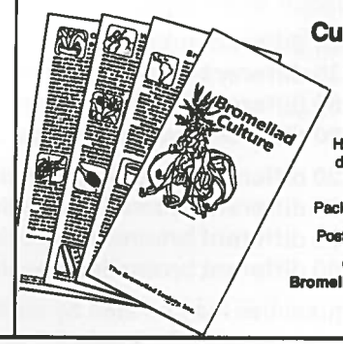

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You are cordially invited to become a member of The Bromeliad Society, Inc.

The Bromeliad Society, Inc., a nonprofit, educational, horticultural organization was formed to promote interest and disseminate knowledge in this interesting family of plants. Membership is worldwide, and includes apartment and home gardeners, greenhouse hobbyists, nurserymen, teachers, scientists, and directors and personnel of botanic gardens. Everyone interested in bromeliads, in learning more about them, in growing them, and participating in the activities of The Bromeliad Society is welcome to become a member.

The activities of the Bromeliad Society consist of

- The publication of the *Journal*, a bimonthly magazine for both amateur and professional, well illustrated in color and black and white.
- The publication of information booklets on bromeliads such as Cultural Handbook, Glossary, and the Handbook for Judges and Exhibitors, etc.
- The fostering of affiliated societies. There are many such groups throughout the world.
- The encouragement of exhibitions and competitive shows featuring bromeliads.
- The sale of bromeliad seeds through the Society Seed Fund.
- The encouragement of correspondence among growers of all countries in order that bromeliads may become better known and more widely appreciated.

Classes of Membership

- ANNUAL: A regular membership for an individual, society, or institution.
- DUAL: Two members at the same address to receive one *Journal*, each may vote, and have all benefits of membership.
- CONTRIBUTING: For an individual, society or institution. Additional funds are used to help underwrite cost of color plates in the *Journal*.
- FELLOWSHIP: Same as contributing, member will receive a copy of the Cultural Handbook.
- LIFE: No annual dues will again be paid for the lifetime of the member. Individual will receive a copy of the Cultural Handbook, a life membership certificate, card, and pin. Not available to societies or institutions.

All memberships commence upon receipt of dues and include the next bimonthly *Journal*. Current back issues are available. Memberships are tax deductible. To learn more, fill out the form below and send it in today.

. . . . . .

Application for Membership to The Bromeliad Society, Inc.

Please fill in every line that applies to you and type or print carefully. Your mailing label is made from this form. Every member should return this application to 2488 East 49th, Tulsa, Oklahoma 74105.

Please check type of membership. International memberships are increased by $5 to cover postage.

Choose one
☐ Individual
☐ Society
☐ Institution

Choose one
☐ Renewal
☐ New Member

Amount Enclosed $_____

Choose one
☐ Annual United States . . . . . $ 20.00
☐ Annual International 25.00
☐ Dual United States 25.00
☐ Dual International 30.00
☐ Fellowship United States 35.00
☐ Fellowship International 40.00
☐ Life 750.00
First Class handling add . . . 7.50

Name_____ Phone (_____)_____

Second name on dual membership_____

Address _____

City_____ State_____ Zip_____

Name and location of affiliate to which you belong_____

_____

Name and address of affiliate president _____

_____

How did you find out about the BSI? _____

Checks should be made payable to The Bromeliad Society, Inc. Members outside the United States should remit by International Money Order or cashier's check payable in U.S.A. funds on any U.S. bank. Personal checks not drawn on U.S. banks will not be accepted.
☐ If money order is to come under separate mailing, please indicate and include a copy, or the number and type of order.

#_____ Money Order _____

H. Hemker

With the publication in 1982 of the description of *Acanthostachys pitcairnioides* (Mez) Rauh & Barthlott, the genus *Acanthostachys* acquired a second species. The 1989 May-June issue of the *Journal* gave a brief description of this species on page 134. We are grateful to Dr. Heinz Hemker for sending this photograph.

Calendar of Shows

15-16 July	San Diego Bromeliad Society 19th Annual Show and Sale. "Carnival of Bromeliads," Casa del Prado, rm. 101, Balboa Park, San Diego, CA. Saturday, 1 P.M. to 5 P.M.; Sunday, 10 A.M. to 5 P.M. Helga Remy, 619-660-0664; Thelma O'Reilly, 619-670-0830; Darryl Groover 619-444-3802.
5-6 August	Indianapolis Bromeliad Society 11th Annual Show and Sale. Glendale Mall, North Keystone and 62nd St., Indianapolis, IN. Saturday 10 A.M. to 9 P.M.; Sunday, noon to 5 P.M. Kirk Butler, 317-271-1934.
5-6 August	South Bay Bromeliad Associates 22nd Annual All-Bromeliad Show & Sale. South Coast Botanic Garden, 26300 South Crenshaw Blvd., Palos Verdes Peninsula, CA. Saturday, noon to 4:30 P.M.; Sunday, 10 A.M. to 4:30 P.M. Plant sales both days 10 A.M. to 4:30 P.M. Bromeliad show and sale free, admission charged to garden. George Allaria, 213-326-4791.
19 August	Seminole Bromeliad Society Show and Sale. Earl Brown Park, DeLand, FL. Saturday, 9 A.M. to 4 P.M., followed by Florida Council of Bromeliad Associates rare plant auction. Guest speaker. Free admission. Charles Tait, Jr., 904-789-1052.
25-27 August	Second International Cryptanthus Show, "Stars over Chicago," sponsored by the Bromeliad Society of Greater Chicago. Chicago Botanic Gardens, Glencoe, IL. Inez Dolatowski, P.O. Box 352, Island Lake, IL 60042. Tel. 312-526-3693.
25-27 August	San Francisco County Fair Flower Show, "Salute to Flowers '89." County Fair Bldg., 9th Ave. and Lincoln Way, San Francisco, CA. 10 A.M. to 6 P.M.; preview Thursday, Aug. 24, 6:30 P.M. to 8:30 P.M. Admission $3.00 general, $2.00 seniors, children under 12 free. Sandie Wernick or Nathalie Ané, 415-928-7414 or 415-928-0919.

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