Journal of The Bromeliad Society

VOLUME 39 • NOVEMBER–DECEMBER 1989 • NUMBER 6

Journal of the Bromeliad Society

Vol. 39, No. 6 November-December 1989

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Cover photographs. Front: *Billbergia zebrina* (Herbert) Lindley, photographed by E.M.C. Leme. His description is on page 244, 246. Back: *Guzmania rubro-lutea* Rauh was first described by Dr. W. Rauh in 1979. The photograph is by Dr. H. Hemker.

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The *Journal,* ISSN 0090-8738, is published bimonthly at Orlando, Florida by the Bromeliad Society, Inc. Articles and photographs are earnestly solicited. Closing date is 60 days before month of issue. Advertising rates are listed in the advertising section. Permission is granted to reprint articles in the *Journal,* in whole or in part, when credit is given to the author and to the Bromeliad Society, Inc. **Please address all correspondence about articles or advertising to the editor.**

Subscription price (in U.S. $) is included in the 12-month membership dues: single – $20.00, dual (two members at one address receiving one *Journal*) - $25.00, fellowship - $35.00, life - $750.00. Please add $5.00 for international mail, except for life members. For first class or airmail add $7.50.

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Back issues: All single copies $4.50 1st class postpaid to ZIP addresses; international $5.50 airmail postpaid. Per volume $20.00 to ZIP addresses, $25.00 to international addresses, 3rd class or surface postpaid. Order 1984-to-date issues from the editor; 1976–1983 from H. W. Wiedman, Dept. of Biological Sciences, Calif. State University-Sacramento, CA 95819. Make checks payable to B.S.I.

Printed by: Cody Publications, Inc., Kissimmee, Florida.
Typography by: Daybreak Distributing, Orlando, Florida.

Copacabana Beach and Its Bromeliads

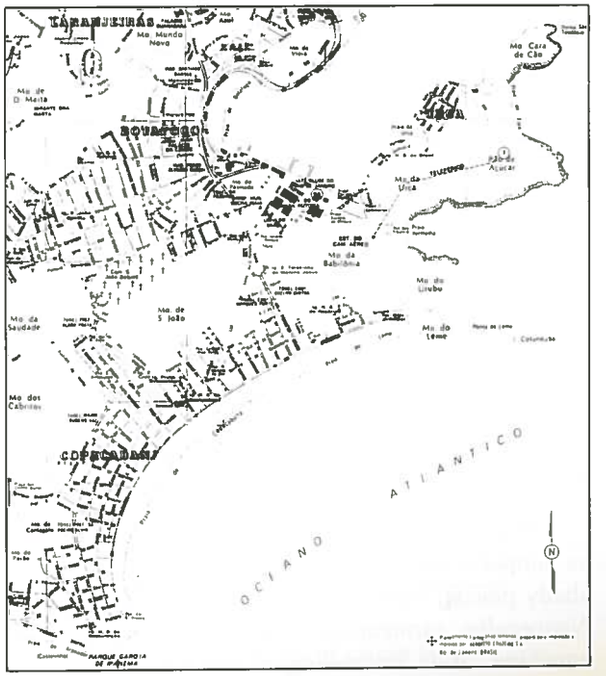
Elton M.C. Leme

Situated in the south side of the city of Rio de Janeiro, Copacabana Beach is one of the best known Brazilian tourist attractions, together with the Sugar Loaf and the statue of Christ the Redeemer. It is separated from the slopes of *Serra do Mar* by a thick wall of tall buildings sheltering one of the largest concentrations of population in the country. It is hard to believe that in such a busy neighbourhood one can see a space where different species of the local fauna and flora do survive.

When you are at Copacabana Beach facing the blue-green sea and looking left towards the end of the beach, you will see a section called "Leme." There, buildings make some room for nature and allow mountains, forest, and ocean to meet. It is just at that spot where Leme Hill rises that nearly 15 different bromeliad species take refuge.

This position, strategic for the defense of the city, has left the entire landscape comparatively preserved; the army occupied the area during the eighteenth century while building a fortress, now in ruins. As a municipal inheritance, it continued to be reserved for military activities until recent times. As a partial result, it forms one of the last places where the maritime vegetation of the city is preserved.

Leme Hill has a steep, thick, granitic wall surrounding it and leaning toward the sea. This wall, mercilessly beaten by the waves, is the home of an immense population of *Vriesea regina* and *V. goniorachis* (fig. 1), which beautifully decorate the rock. Here and there outstanding groups of *Tillandsia araujei* appear among cactus and orchids, as for instance the scented *Brassavola fragrans.*



Author

Fig. 1
Neoregelia cruenta, Tillandsia araujei, Vriesea goniorachis and *Brassavola fragrans* growing on Leme Hill.

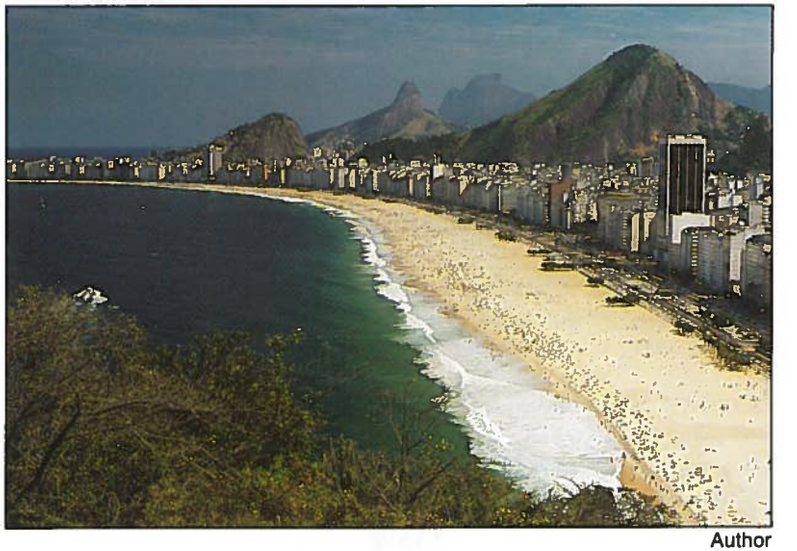
As the rock becomes less steep, allowing the formation of subsoil, *Neoregelia cruenta* (fig. 1) shows up, growing under intense sunlight and presenting yellow leaves that become red toward the tip. From there on, a bushy vegetation begins to develop rapidly reaching forest stature and covering the upper part of Leme Hill. At this height, we observe isolated populations of *Aechmea bromeliifolia*, thriving on the shaded ground. From here, the forest extends to the lower parts, passing by Anel Beach and reaching Urubu Hill.

In these tracts of woods several epiphytes can be observed such as the common *Aechmea nudicaulis, Vriesea procera, Tillandsia stricta* and *T. tenuifolia.* We also found an epiphytic clump of the giant *Streptocalyx floribundus* with white petaled flowers giving out a sweet perfume so intense that it can be detected at a distance.

Within this forest there are many granite blocks that surely in the past served as supports for many species of bromeliads, lovers of damp but well-drained, shady places. Now, there are only shy representatives of *Billbergia amoena* and *Neoregelia sarmentosa.* The latter also develops without problems in the sunshine. It is interesting to observe that although *Billbergia zebrina* (cover

Lena Trindade

Fig. 2
Pitcairnia flammea growing along the edge of the woods on Leme Hill in a damp and shady area.



Author

Fig. 3
The view of Copacabana Beach from the top of Leme Hill.

photograph) is typically an epiphyte of the coastal Atlantic Forest, we found a vigorous cluster growing among the rocks at the edge of the woods on the sea side.

In some rock walls along the edge of the forest, damper and more protected from the sun, there are interesting groups of *Pitcairnia flammea* (fig. 2).

From the top of Leme Hill, the scenery is of rare beauty. Fixed in the rock, the huge cannon of the Duke of Caxias Fort, long out of action, preserve the memory of olden days. On the one side, the view of Copacabana Beach (fig. 3) is one of eternal summer. On the other, the Sugar Loaf (Pão de Açúcar), the last refuge of *Vriesea brassicoides,* shows one of its less familiar faces.

An organization called AMALEME (Friends and Dwellers Association) has been formed to continue the preservation of the area and to restore the fauna and flora of the whole region composed of Leme Hill, Anel Beach, and Cotunduba Island. This organization has been working since 1987 to establish it as an official environmental protection area with the objective of restoring the fauna by means of improving the flora. This work is being done by Plinio S. Senna.

In its first stage, the aim is to grow fruit trees to give better conditions to the 65 species of birds found there. The next step will be the reintroduction of several bromeliad species that have already disappeared, like *Bromelia antiacantha, Cryptanthus acaulis, Nidularium microps, Quesnelia quesneliana, Vriesea inflata, Tillandsia gardneri* among others.

We hope that by increasing the interest of public authorities the work begun by AMALEME and its devoted members will be successful. Who knows? The future Copacabana Beach and Leme Hill may become even more famous because of their rich bromeliological flora.

Rio de Janeiro, Brazil

ADVERTISEMENTS AND NOTICES to appear in the March-April 1990 *Journal* must reach the editor not later than 2 January 1990. —Ed.

A Comparison of *Tillandsia macdougallii* with *T. oaxacana*

Renate Ehlers

For many years I wondered what *Tillandsia oaxacana* might be. Whenever I went to a botanical garden, a private collection, or to a commercial plant nursery I asked for *T. oaxacana.* Nobody but I seemed to have any difficulty with identifying this plant. Everybody thought that he owned *T. oaxacana* and was convinced that his plant was the real thing. All the plants, however, turned out to be *T. macdougallii* or related to *T. matuda* but with a distinct scape. They were all imported from Guatemala. None matched the description of *T. oaxacana.*

In her dissertation, Sue Gardner is dubious about the distinction between the two species and suggests that they should be investigated. Her drawing seemed to me to be *Tillandsia macdougallii.*

There are only two evident differences between the plants: *Tillandsia oaxacana* has adpressed-lepidote leaves and dark, castaneous sheaths. *T. macdougallii* has cinereous, spreading scales, and sheaths concolorous with the blades.

Tillandsia macdougallii is a very variable plant and in its home locations the sheaths are sometimes very dark. In cultivation, the plants become lighter in color and that may be why people have thought that they own *T. oaxacana.*

In studying the descriptions by L.B. Smith, I saw that MacDougall collected both of the type plants near Lachatao, Oaxaca, in Mexico: *T. oaxacana* on 21 December 1947 and *T. macdougallii* on 31 December of the same year. Dr. Smith described both plants in 1949. I could not believe that a botanist of his qualifications would have described two similar plants from the same locality. I was sure that there must have been significant differences.

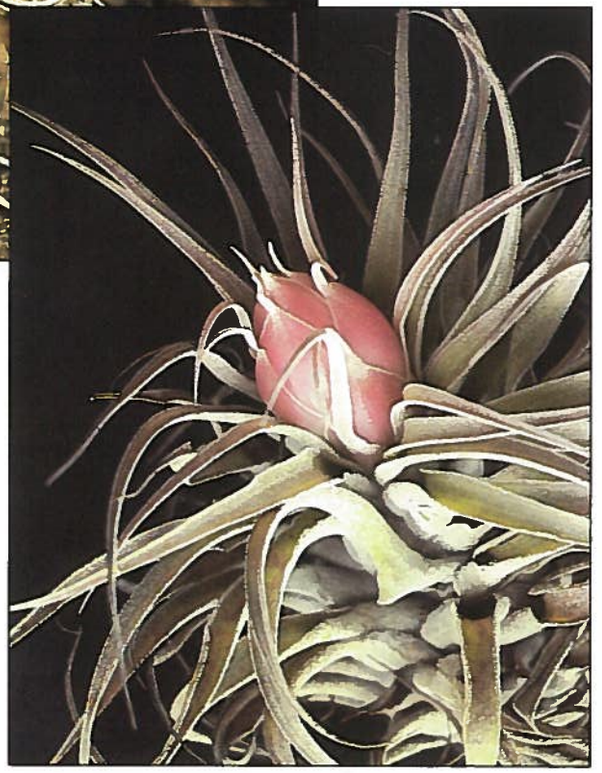
In reading the description of *Tillandsia atrococcinea* Matuda[1] I found that plant very similar to *T. oaxacana* and soon suspected that it might be the real *oaxacana.* Nobody except our friend Dr. Jürg Rutschmann believed me.

Since I wanted to solve the problem, I decided to go to the type locality and wrote to Dr. Smith for information. Only three days before leaving for our trip to Mexico in February 1988, Dr. Smith was kind enough to send a very good photo of the type of *Tillandsia oaxacana* and it became evident that *T. oaxacana*

1. Cact. Suc. Mex. 22(1): 22-23, fig. 13; Oct.-Dec. 1977.

Fig. 4

Photographs
by the author.

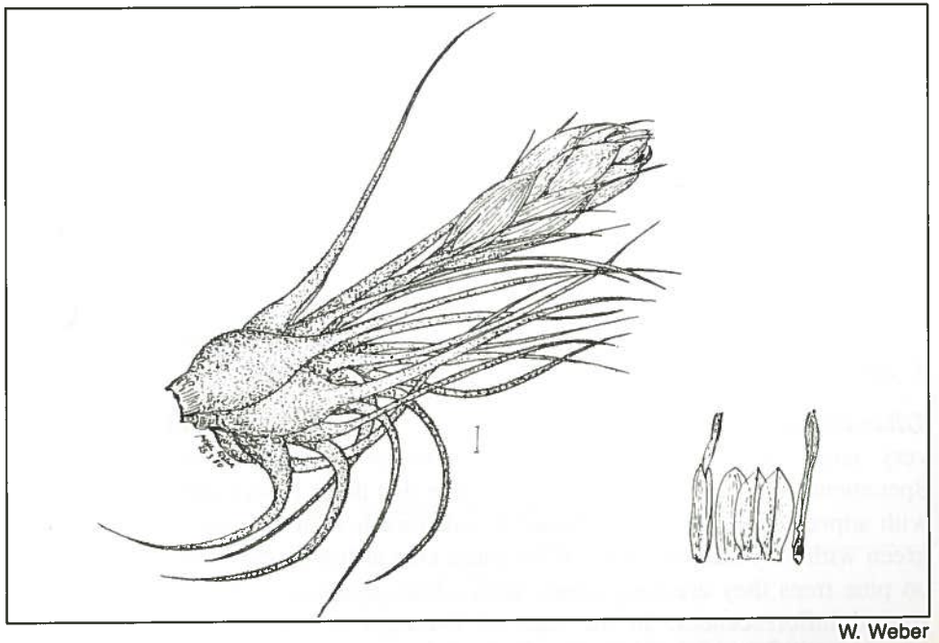


Tillandsia oaxacana (above) and *T. macdougallii* (right) were found growing near each other between Tlaxiaco and Putla de Guerrero, Oaxaca.

Fig. 5

Author

Fig. 6. *Tillandsia oaxacana* L.B. Smith, collected by the author (EM 882407) near Tlaxiaco, Oaxaca; 1650 m.



W. Weber

Fig. 7. *Tillandsia macdougallii* identified by Wilhelm Weber in 1980 from the Halle (East Germany) Herbarium specimen HAL 45541, collected by L.B. Karwinski, 1830. The centimeter scale has been added.

L.B. Smith is the same plant that Matuda described in 1977 as *T. atrococcinea.* Nevertheless, we wanted to go to the type location, to Lachatao.

We found the small village easily on the map of Oaxaca, between Oaxaca and Valle National, not very far from the main road. In reality it was not so easy to get there because, as it turned out, it was a very small place and nobody seemed to know where the road was. Twice we were directed to the wrong road and drove for hours. There were no houses, no one to ask and, of course, no signs. Finally, we decided that the map was wrong, but 15 kilometers are not very much in Mexico. We reached Lachatao in the late afternoon. It is a nice little village but in a dry area and neither *Tillandsia oaxacana* nor *T. macdougallii* could grow there. So we drove up to higher elevations. At the very last minute, just before the sun went down, we found *Tillandsia macdougallii* and *T. violacea* growing on the pine trees but could not find any *T. oaxacana.* A little disappointed, we returned to Oaxaca.

Sometimes it is funny where the type plants come from. *Tillandsia macdougallii* grows in so many places very close to the main roads in Mexico. Very big plants, with long, drooping inflorescences grow near Río Frio, only one hour from Mexico City on the way to Puebla, and you can see them from the car. In Oaxaca, it grows near the main roads also. But MacDougall collected the plants in the Sierra of Lachatao, which seemed to us nearly at the end of the earth.

MacDougall was not the first one to collect *Tillandsia macdougallii* since Karwinsky as early as 1830 had collected that plant near S. Andrés, Oaxaca, and had sent it to the herbarium in Halle (East Germany) (HAL 45541). Wilhelm Weber found the plant and made a drawing of it in 1980 (fig. 7).

Although we did not find *Tillandsia oaxacana* at Lachatao, we were happy to find both it and *T. macdougallii* very near the main road between Oaxaca and Valle National. We also found both plants growing near each other between Tlaxiaco and Putla de Guerrero, both in the state of Oaxaca (fig. 4 and 5).

Comparison of the collected plants shows that *Tillandsia macdougallii* and *T. oaxacana* are very variable.

Tillandsia macdougallii L.B. Smith. Plants from near Orizaba or Río Frio are very large, with long, pendent inflorescences and lanceolate floral bracts. Specimens from Oaxaca differ very much in that those from Lachatao are silvery with adpressed scales. When found in oak forests near Tlaxiaco, they are light green with very dark sheaths. In the same area at higher elevations and growing on pine trees they are very small, with white, pruinous scales, and short, egg-shaped inflorescences. In the state of Durango in northern Mexico between Mazatlán and Durango, they are similar to the type plants from Lachatao. The plants we collected near Vallarta on a small road leading to a mine are nearly

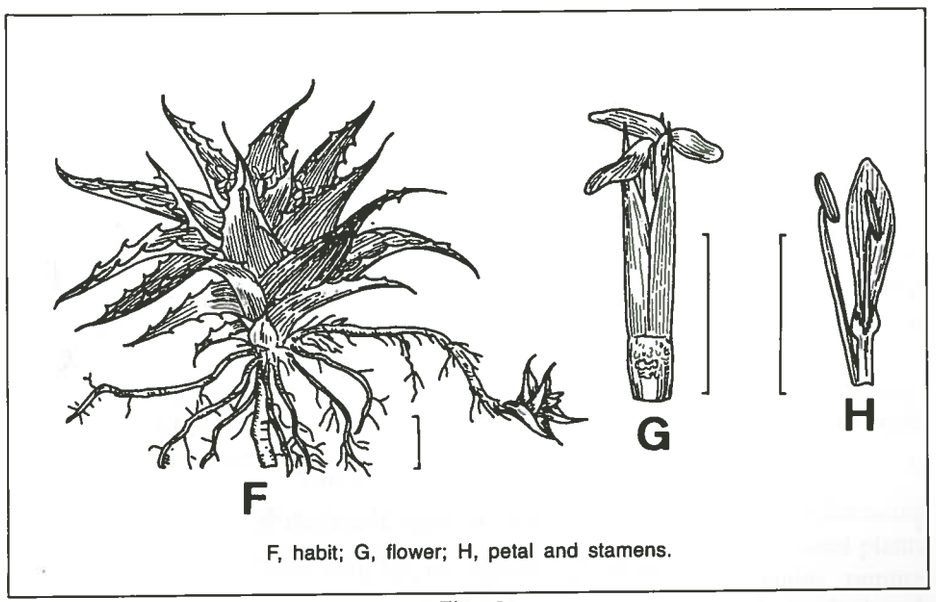
[cont. on page 272]

Misnamed Bromeliads, No. 5; *Orthophytum saxicola,* a Clarification

Harry E. Luther

It has recently come to my attention that the common, cultivated plants universally grown as *Orthophytum saxicola* (Ule) L.B. Smith do not represent the typical variety of that species. Cultivated material produces an elongated, conspicuous scape with long, foliaceous scape bracts. That plant represents variety *aloifolium* L.B. Sm. Plants of var. *saxicola* are very rarely encountered in horticulture but the persistent collector may be able to locate it as *Orthophytum* 'Huntington' of Huntington Gardens. For some reason that cultivar of var. *saxicola* has never been widely distributed. *Orthophytum saxicola* var. *saxicola* may be distinguished by its more or less sessile inflorescence with very short scape bracts.

Perhaps with this clarification in mind culturists will no longer comment on the supposed inaccuracy of the plate of *O. saxicola* in *Flora Neotropica* monograph 14, pt. 3, p. 1701 and reproduced below.



F, habit; G, flower; H, petal and stamens.

Fig. 8
Orthophytum saxicola var. *saxicola*

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

Racine Foster's Accomplishments Recognized

Edward G. McNulty

C.O. Branneky

Fig. 9
Mr. McNulty with Mrs. Foster at presentation ceremony.

Racine Foster is certainly one of the best known authors on the subject of bromeliads with many articles to her credit in both *The Bromeliad Society Bulletin* and the *Journal of the Bromeliad Society* and as co-author of *Brazil,* the account of an extensive collecting expedition with her husband Mulford. She and Mulford founded the *Bulletin* in 1951 and edited it for eight years. When not actively taking part in collecting expeditions, she prepared the herbarium specimens that Mulford sent from the field. She is a bibliographer of bromeliad literature, custodian of an extensive living plant collection, an active participant in local bromeliad society activities, and archivist of bromeliad history.

In recognition of these many contributions, Mrs. Foster was honored at a gathering on the second of September this year with a plaque presented by Edward G. McNulty, president of the Bromeliad Society of Central Florida. The plaque is inscribed:

Presented to

Racine Foster

In Recognition of Your
Contribution to the Research
and Knowledge of Bromeliads
by the
Bromeliad Society of Central Florida
and the
Florida Council of Bromeliad Societies
1989

A Geography Lesson

Carol Johnson

Prospective bromeliad buyers most often ask: 1. How much light is best for this plant? and 2. Will it take cold if planted outdoors? Rarely do they ask, "Where does this plant come from?" Yet, this is the most important of all information required to grow bromeliads successfully and the answer to this question will also settle the first two. Geography plays a major role in the growing of our plants—altitude, moisture, and heat go along with this.

Bromeliads from southeastern Brazil generally do very well in Florida. That is because their latitude is very similar to ours, their altitude is not too far out of line and Brazil does have definite winter and summer seasons just as we do. I have always made it a practice, when ordering bromeliads to be shipped by mail from Brazil, to do so either in the spring or fall so that the plants will not be coming from extreme heat into our coldest season, or vice versa. Think about it. Vrieseas, nidulariums, neoregelias, quesnelias, our toughest species, are from southeastern Brazil.

Altitude is perhaps the greatest determining factor in the success or failure of plants imported into Florida. Most high altitude plants are tillandsias, vrieseas, guzmanias, or pitcairnias, and puyas. Most of the bromeliads that are grown successfully in collections are those found growing under 5,000 ft. If you doubt me, check your Padilla. It is often possible to get high altitude plants through a first blooming, but then they fail to pup and just die. *Tillandsia imperialis,* perhaps the most beautiful bromeliad of all, grows and blooms in the cloud forests of Mexico. In October 1984, we brought back blooming specimens which lasted for months, but we had to regard them as cut flowers and know that the growing plants could not survive or reproduce at sea level. On our recent trip to Ecuador, it was a great temptation to collect the beautiful pitcairnias, guzmanias and tillandsias found blooming at 8–10,000 ft. However, it has been painful to watch those I could not resist wither and die, one by one, in our Florida summer. In borderline cases, plants brought back to Florida from high altitudes during our winter months stand a better chance of survival.

Humidity is perhaps the least understood of all the factors influencing bromeliad growth. Humidity is not just water, it is atmosphere. Terrestial plants (hechtia, dyckia, puya, cryptanthus) need water. Epiphytic plants require humidity and are engineered to retain it in some fashion. Many bromeliads are murdered because of the misunderstanding about humidity vs. water. Example: some years ago I made an investment in a stock of *Tillandsia tectorum* and was told they must be kept very dry—no watering whatsoever. Of course, in our dry season and in the greenhouse, they all died. The misunderstanding is reasonable,

the habitat of *T. tectorum* is perhaps the dryest in South America. In Lima, Peru, in 1983, a woman at our hotel told me that her six-year old child had never seen rain. However, every night, heavy fog rolls in from the Pacific and drenches the plants, which soak up the moisture like sponges. Now my tectorums get soaked by every rain and as long as they dry out between waterings and have plenty of air circulation, they thrive. Most culture information in print still lists the dyckias as dry growing plants "suitable to be grown with cacti." For pot culture, this is absolutely untrue. Dyckias, pitcairnias, hechtias are all terrestial plants and must have a water source to produce sustaining roots. They will tolerate dry, hot conditions overhead as long as the roots are kept moist. Hechtias collected in Honduras were growing on cliffs where water poured over them constantly. Pitcairnias (and they have been present everywhere we have collected) were all growing along wet creek banks or on moist, dark cliffs.

Light. For many years I struggled to grow *Tillandsia punctulata* without much success. It neither lived nor died. Then, in Mexico, at about 3,500 feet, we collected *Tillandsia punctulata.* It was growing in the tree tops in cool, dense shade and nurtured by wet, rotted leaf mold. That taught me a lesson about the tillandsias. All those years I had lumped all tillandsias together, as sun-loving, dry-growing epiphytes. Now I know that every tillandsia, in fact every bromeliad, should be researched before becoming part of a collection.

It is fairly easy to classify plants as tender or hardy when you know the native habitat:

1. Plants from Mexico, Central America and the Caribbean are all extremely cold-sensitive. Examples: *Aechmea lueddemanniana. A. mexicana, A. smithiorum.*

2. Plants from Brazil, Argentina, Chile and Bolivia adapt best to our North American growing conditions and extremes of heat, cold, wetness and dryness. Examples: *Aechmea distichantha, Vriesea carinata, Vriesea schwackeana,* the nidulariums and most quesnelia.

3. Plants from the Amazon Basin, its tributaries, in fact all of sea level equatorial South America, will tolerate no cold and would prefer a stable, constant growing environment. Examples: *Aechmea chantinii, A. zebrina,* all the streptocalyx, *Neoregelia eleutheropetala.*

4. Items 1 through 3 presuppose that the plants in question originate at an altitude acceptable for Florida culture.

Every bromeliad grower should make a point of securing a copy of *Bromeliads for Home, Garden and Greenhouse* by Werner Rauh and reading the first 18 pages of the book. He says the same as I, but has the space to do it much better.

Reprinted from Florida Council of Bromeliad Societies Newsletter, *Nov. 1988.*

Cryptanthus from Seed to Seed

Arla Rutledge and Harvey Kendall

Earth Star is the fitting common name applied to these unusual plants. While in the jungle a number of them are found growing as epiphytes, the majority are found on the jungle floor. The genus name means "hidden flower." It was entered into horticulture in the early 1800s. To a certain degree, the flowers are hidden, in that they grow out from the axis of the leaves. They are pure white with few exceptions. There is one species with yellow flowers, but it is rarely found in cultivation. There is one with lovely pink flowers and dark burgundy foliage. It is uncertain whether it is hybrid or a species. . . .

Approximately 50 species and varieties of *Cryptanthus* have been recorded. However, the hybrids developed in the last few years far surpass that number.

In cultivation we find the most convenient and successful method of growing cryptanthus is in pots containing mixes using peat, perlite, leaf mold, vermiculite or a good indoor planting mix that drains well. Many times, cryptanthus are found growing vigorously under the benches in the greenhouse. Their two most important requirements are heat and humidity. Many of them have succulent leaves that quickly burn if given a spot in too much sun. They need to be kept moist to insure healthy growth. Their various leaf markings can deepen in color if given controlled filtered light, and their sizes can range from 3″ or 4″ up to 36″, the majority being 8″ to 10″ across.

PROPAGATION

One method of propagation is by offshoots. Many cryptanthus produce pups in the axis of the center leaves; others appear lower on the base. Some appear on stolons. One species in particular, *C. pseudocaposis* ('Cascade'), can produce plants at the end of a two-foot long stolon.

The time for removal of the offshoots, particularly those in the leaf axis, is when the offshoot gently tugged comes loose easily. They are then ready to be planted in your chosen medium.

Another method of propagation is by growing from seed. In order to obtain seed, hand pollinating must be performed. Close examination of the plant in bloom will show two different blooms, male and female. The male or imperfect flower is usually found in the very center of the plant and has no pistil or female part. The perfect flower will bloom from the axis of the plant; however, the pollen from the stamens in this flower is not fertile. Only the pollen obtained from the stamens of the imperfect flower is fertile. Normally the perfect and imperfect flowers in a single plant are not in bloom at the same time, making pollinating

difficult. The male flowers usually bloom first, so the pollen from them must be saved until the perfect flower blooms. Pollen can be collected by brushing it off onto waxed paper. Store it in a glass jar in the refrigerator. A more fortunate method is to have two plants alike in bloom at the same time.

The female pistil is a stem with three boat-shaped sections at the tip. The pollen is received in the center of each section. The pollinating time may vary, depending on the amount of heat and humidity in your greenhouse or house. It is usually around 11:00 a.m. A strong magnifying glass will reveal the drop of honey in the middle of each section, signifying that the pistil is receptive.

Success in pollinating is evident in about 2 or 3 weeks, when you will notice the fruit start to show deep in the axis. The berries will grow and remain green, ripening in about 3 to 4 months with no change in the color of the fruit. The fruits will be soft to the touch when ripe but can not be removed whole from the axis of the leaf, where they remain firmly wedged. Tweezers are very helpful. About the only way to remove the seed is to dig it and lift it out with the tweezers. The seeds are about 2 or 3 mm in diameter, brown and not uniform in shape. You can harvest from one to 10 or perhaps 12 in each ripened fruit. It will not be necessary to wash these seeds before planting.

PLANTING

A plastic container with a lid such as a margarine tub is ideal for planting. Be sure to burn holes in the bottom of the container first.

A medium of one part each of peat, perlite (sponge rock) and a good indoor planter mix is excellent. The planter mix should be run through a sieve to remove larger items in the medium. Moisten the medium and firm it in the container. Place the seeds well apart on the medium, tag, date, place the lid securely on, put the container in a warm, shaded place and prepare to wait, and wait. The germination time is between 6 and 8 weeks. The seedlings grow faster than do most bromeliads.

When all are well germinated and about ½" across, start hardening them off by displacing the lid a little at a time for several days. You may start feeding lightly when watering after the lid is removed. Using rain water or bottled water, you may use your all-purpose fertilizer at ¼ strength. Place the germination container in a larger container and let the water soak up. Overhead watering can be fatal to the young plants. Fertilizing may be done each time you water at this strength.

When the seedlings reach about ¾" across, they should be put into a larger container, using the same type medium, premoistened, as in the germination pot.

When the seedlings have reached approximately 3" to 4" across, you may step them up into individual pots, a 3½" or 4" pot should be used; the planting medium

should be the same as used in the community pot. The plants will not have much of a root system, but the larger pot will protect the ends of the leaves from being broken. You are now ready to wait for bloom and offshoots.

HYBRIDIZING

Crossing can be accomplished in the same manner as described above. It may be possible to have two different species in bloom at the same time. You can produce several quite unusual plants from hybridizing, or, depending on the plants used, you may get almost 100% of the stronger marked plant. Using any variegated cryptanthus, such as 'It', you may expect more than 50% to germinate pure white, and due to the lack of chlorophyl, they will die shortly. When two hybrid plants are crossed, a certain percentage of poorly colored, weak foliage can occur. There will be enough unusual plants to make it worth while; it's sort of like Christmas. You never know what you are going to get.

Reprinted from the Journal, *vol. 28, pages 211-213; 1978.*

1990 World Bromeliad Conference

Sponsored by
BROMELIAD SOCIETY/HOUSTON, INC.
THE SOUTHWEST BROMELIAD GUILD, and
THE BROMELIAD SOCIETY, INC.
June 6 - 10, 1990

Now is the time to start planning a family vacation around the 1990 WORLD CONFERENCE in Houston. Most of our efforts will be concentrated on making this World Conference the best that you have ever attended. However, if you have the time, we also want to help you expand your enjoyment to other interests you may have in addition to bromeliads. We don't have everything, for instance there are few mountains to climb and snow skiing will be very limited. There are few other limitations as you can see from the list of tourist attractions for this area sent to you in the September-October 1989 *Journal.* Don't forget to include the post-conference garden tours in your plans. Let us know if we can be of further assistance in your planning a SPACE OUT family vacation.

Registration Chairman:
Betty Head
7818 Braes Meadow
Houston, TX 77071

A New Species of *Cryptanthus* from Brazil

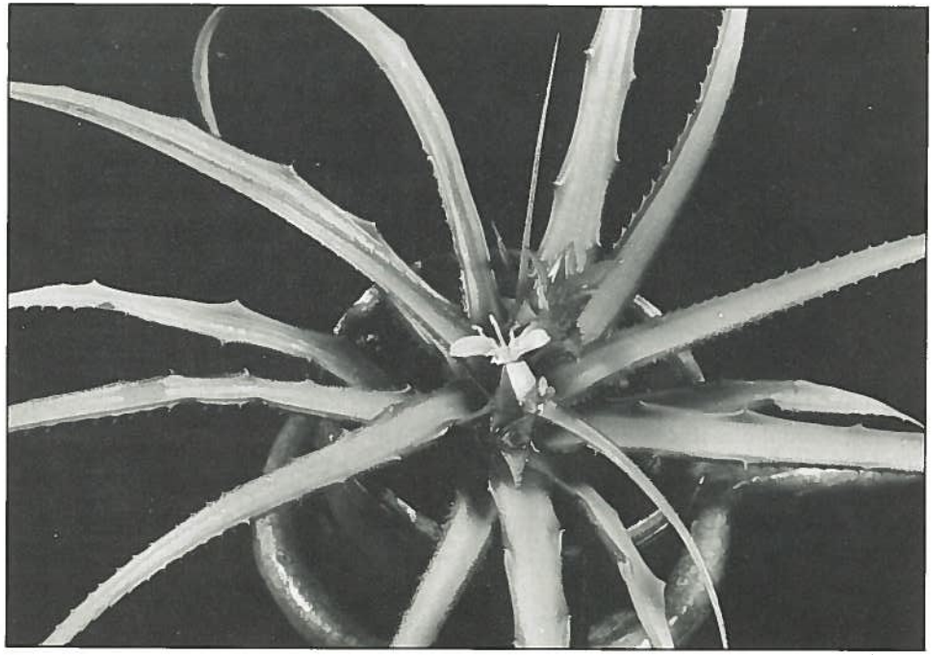
Werner Rauh, Elvira Gross, and Elton M.C. Leme

***Cryptanthus colnagoi* Rauh et E.M.C. Leme**

Cryptanthus schwackeanus Mez similis, sed ab ed differt characteribus sequentibus: Lamina supra lutea-viride cum margine anguste acriter viride. Sepala non 6–7 mm sed 17 mm longa, anguste lanceolate, non ovo similes. Amplificatio caulibus renovationibus infra inflorescentiones non stolonibus basilibus.

Holotypus: B.G.H. 69 073, leg. Euclido Colnago (Brasilia) s.n., in herb. inst. bot. system. univ. Heidelb. (HEID).
Patria et distributio: terricola prope Potiraguá, Estado Bahia, Brasilia, apud 1000 m.s.m.

Cryptanthus colnagoi Rauh & E.M.C. Leme is related to *C. schwackeanus* Mez but differs from it in the following characteristics:
Leaf blades above yellow-green with a small dark green margin, not uniformly green. Sepals 17 mm, not 6–7 mm long and narrow-lanceolate, not ovate. Propagating by offshoots below the inflorescence, not by rhizomes.



Author

Fig. 10
Cryptanthus colnagoi, showing the flat rosette with the long, narrow leaves.

Author

Fig. 11
Cryptanthus colnagoi, showing the inflorescence with offshoots and the bicolored leaves.

Holotype: B.G.H. 69 073, leg. Euclido Colnago (Brazil), without no., in Herb. Inst. System. Bot. Univ. Heidelberg (HEID).

Locality and distribution: terrestrial near Potiraguá, about 1000 m, State of Bahia, Brazil.

Plant solitary, short caulescent, propagating by offshoots below the inflorescence. *Leaves* in a spreading, flat, 50-cm diameter rosette. *Sheaths* conspicuous, ±2 cm long and 2.5 cm wide, white, glabrous at the base, in the upper third lepidote. *Blades* narrow-lineal, not contracted at base, above the sheath 1.2 cm wide, merging into a filiform apex, 25 cm long, succulent, above yellow-green, lustrous, with a small, dark green, revolute margin, nearly glabrous (fig. 11), beneath nerved and densely lepidote (scales in rows), densely serrate with very small (± 1 mm) spines, between these in intervals of 1–2 cm bigger and firmer spines. *Scape* very short (1.5 cm). *Scape bracts* 2–4, subfoliate. *Inflorescence* simple, with 2–4 flowers (fig. 10), 3 cm long (incl. the exserted filaments). *Floral bracts* lanceolate-acuminate, 12 mm long, 3 mm wide, thin membranaceous, with a brownish, lepidote apex, otherwise white with brown nerves, half as long as the *sepals;* these up to 17 mm long, narrow-lanceolate, connected unequally at the base, white, greenish at the tip and brown lepidote, the posterior carinate. *Petals* white, half connate, up to 2.5 cm long with ligulate, curved blades. *Filaments* 2 cm long, the pale yellow, dorsifixed anthers exserted.

Style with the spreading white stigmas shorter than the filaments. *Ovary* cylindric, 5 mm long.

Like most of the *Cryptanthus* species, *C. colnagoi* is an attractive plant even in its vegetative state. The succulent, bicolored, and spreading blades produce a flat rosette. In contrast with all other species of the genus, it has a strong and richly branched root system (fig. 12).

We are very indebted to Roberto Kautsky (Domingos Martins, Brazil) for sending living material to Heidelberg, and to Elton M.C. Leme (Rio de Janeiro, Brazil) for his collaboration. The plant was named in honour of its discoverer Euclido Colnago, Brazil.

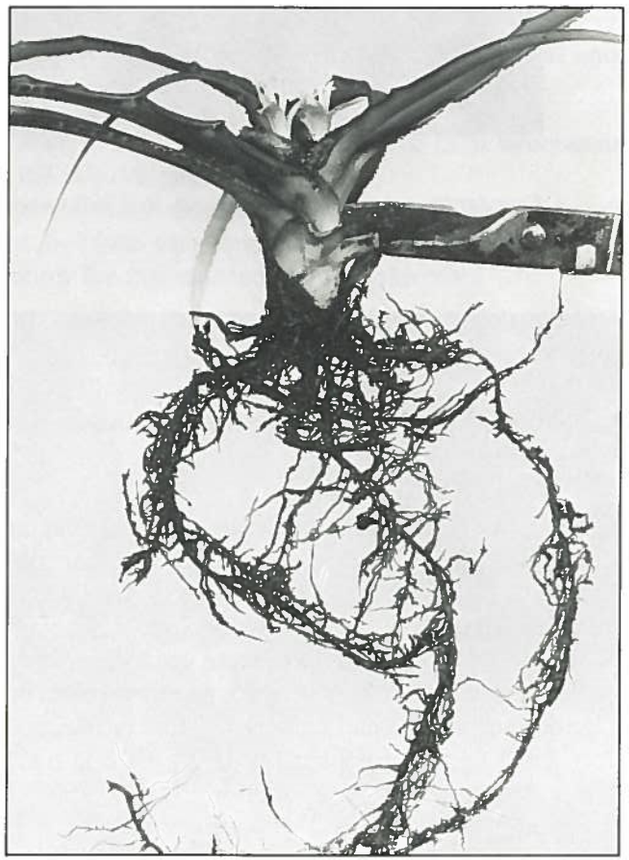


Fig. 12
The richly branched root system of *Cryptanthus colganoi* is displayed in this photograph.

Author

Heidelberg, West Germany

Announcement of Epiphyte Symposium

The Marie Selby Botanical Gardens in celebration of its fifteenth anniversary will hold an international symposium entitled "The Biology and Conservation of Epiphytes" in Sarasota, Florida, USA, on May 5–8, 1991. This symposium will be modelled after the first Tropical Epiphyte Symposium held at the gardens in September, 1985. The major goal of the symposium is to foster exchange of information on epiphytes across lines of individual disciplines, geographical areas, and plant taxa. Invited and contributed papers will address botanical, ecological, and horticultural topics pertaining to tropical and temperate vascular and nonvascular epiphytes, including their systematics, ecology, interactions with canopy fauna, physiology, conservation, micropropagation, and cultural management in glasshouses and botanical gardens. The large collection of living plants at Selby Gardens will be open to conferees. It includes specimens of Orchidaceae, Bromeliaceae, Araceae, Gesneriaceae, and Pteridophyta. The symposium is open to all biologists and horticulturists interested in epiphytes.

PRELIMINARY REGISTRATION FORM

If you are interested in receiving additional information on the symposium please return this preliminary registration form to Dr. Nalini M. Nadkarni, Director of Research, The Marie Selby Botanical Gardens, 811 South Palm Avenue, Sarasota, Florida 34236, USA. You will receive a second circular by January 1, 1990, with details on the program of speakers, the preparation of abstracts of contributed papers and posters, the accommodations in Sarasota, and a final registration form.

Symposium on The Biology and Conservation of Epiphytes, 5–8 May 1991

Name _____

Address _____

City_____ State_____ Zip_____

Telephone _____

I ☐am ☐ am not interested in contributing a short paper or poster, tentatively entitled: _____

_____

New *Lymania* Species and Identification Key

Elton M.C. Leme

In January of 1986 on the sixth day of an excursion to the state of Bahia,[1] we discovered a bromeliad specimen that, by its winged ovary, could be either a *Lymania* or an *Aechmea*. Sometime later, in October of 1987, it flowered in cultivation proving to be, according to our expectation, a new *Lymania* species that we named *L. azurea* Leme[2] (fig. 14) because of its light blue petals.

Almost at the same time, another bromeliad specimen started to bloom in cultivation. Once again we had in hand a very beautiful new *Lymania* species we called *L. globosa* Leme[3] (fig. 15) as its leaves form a globose and very distinct water reservoir. It was originally collected by the botanist André M. de Carvalho at Itamarajú, Bahia. Now, with six known *Lymania* species, the identification of such species has become a bit more problematic. That being the case, the need for an easier way of identifying these gracious plants, and giving a more general view of the genus, encouraged us to make a provisional key on the basis of the available botanical descriptions and drawings, dried material deposited in the Rio de Janeiro Botanical Garden herbarium, as well as the living specimens flowered in cultivation.

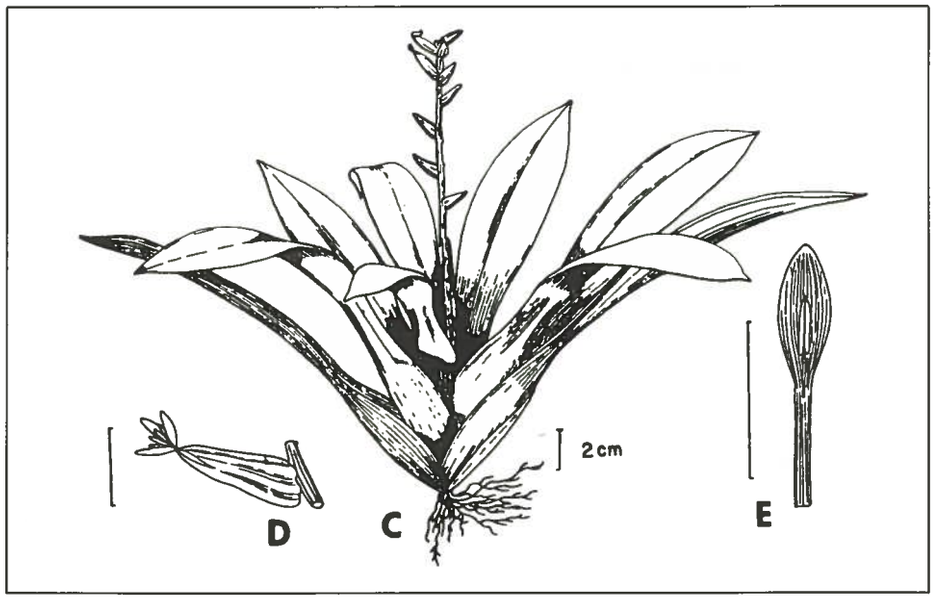


Fig. 13
Lymania marantoides L.B. Smith, R.W. Read. C, habit; D, flower; E, petal and stamen. From: Smith & Downs (1979) figure 600.

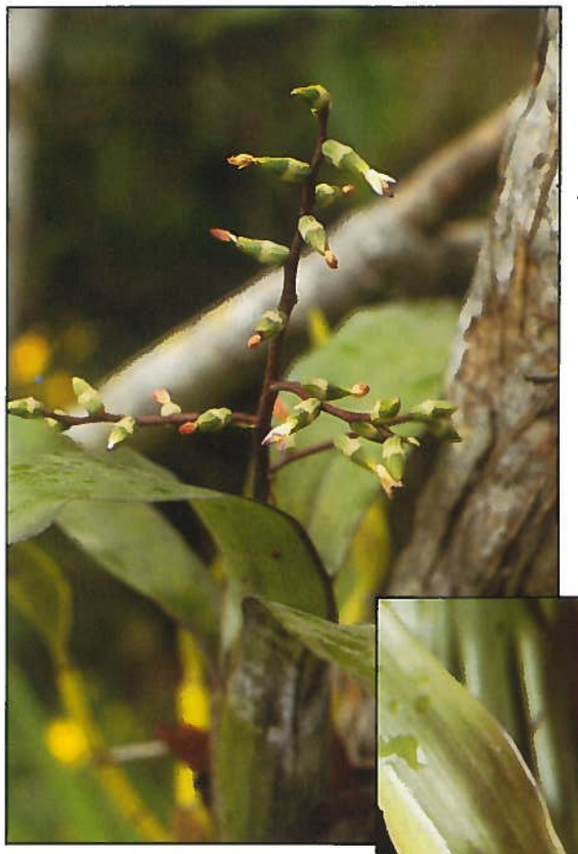


Fig. 14
A new *Lymania* species named *azurea* because of its light blue petals.

photos by the Author

Fig. 15
Lymania globosa, another new species. Its leaves form a globe-shaped water reservoir.

Key to the Species of *Lymania*

1. Sepals ecarinate.
   2. Flowers about 13 mm long (without petals); sepals almost free; petals light blue and after anthesis reddish; ovary deeply sulcate ..... *L. azurea.*
   2. Flowers up to 8 mm long (without petals); sepals connate at base up to 2.5 mm; petals white.
      3. Leaves forming a funnelform water reservoir at base; inflorescence tripinnate but usually bipinnate with at least 5 branches; ovary deeply sulcate; ovules long caudate ..... *L. alvimii.*
      3. Leaves forming a tubular water reservoir at base; inflorescence simple or bipinnate with 1–3 basal branches; ovary 6-alate-carinate; ovules obtuse or apiculate ..... *L. smithii.*
1. Sepals distinctly bicarinate with keels prolonging on the ovary.
   4. Leaves almost subpetiolate; inflorescence simple, lax; ovules long caudate ..... *L. marantoides.*
   4. Leaves moderately narrowed at base if at all; inflorescence bipinnate at base, subdense; ovules caudate or apiculate.
      5. Leaves forming a tubular water reservoir at base; inflorescence red and glabrous; primary bracts present at anthesis; petals white; ovules caudate ..... *L. corallina.*
      5. Leaves forming a globose water reservoir at base; inflorescence green and lepidote; primary bracts lacking at anthesis; petals greenish blue; ovules apiculate ..... *L. globosa.*

We had some obstacles in the task of preparing such a key relating to lack of supplementary data on *Lymania marantoides* L.B. Smith, R.W. Read (fig. 13), that was known from the type collection only. On the other hand, we were lucky to find in the Rio de Janeiro Botanical Garden herbarium a specimen that we identified as *L. marantoides,* although a few of the characteristics observed in this material were not in the original description of the species. This dried specimen, however, was considered in the key at the top of this page.

With more intense botanical research to be carried out in the water-loving Atlantic Forest of Bahia, we believe that both the number of known species of *Lymania,* as well as the new field data to be obtained, will increase. These factors will allow the building of a clearer and more definitive identification key for *Lymania* species.

Rio de Janeiro, Brazil

NOTES:

1. J. Brom. Soc. 36:243-249, 256-257; 1986.
2. Bradea 4(50):392-405; 1987.
3. as above.
4. *In addition to the illustrations of* L. azurea *and* L. globosa *here, see:*
   L. alvimii *J. Brom. Soc. 34:215.*
   L. corallina *J. Brom. Soc. 34:214.*
   J. Brom. Soc. 39:218.
   L. smithii *J. Brom. Soc. 34:215.*
   J. Brom. Soc. 35:118.

The Florida Bromeliads: *Tillandsia utriculata*

Bradley C. Bennett

With leaves up to one meter long and an inflorescence sometimes exceeding 1.5 m, *Tillandsia utriculata* Linnaeus is Florida's largest native bromeliad. Commonly known as giant wild pine it has another distinction. It is one of the few monocarpic tillandsias. Most species produce offshoots but *T. utriculata,* like the century plants, dies after fruiting. There are some exceptions. Small plants, especially those with damaged inflorescences occasionally form offshoots but most Florida giant wild pines flower only once.

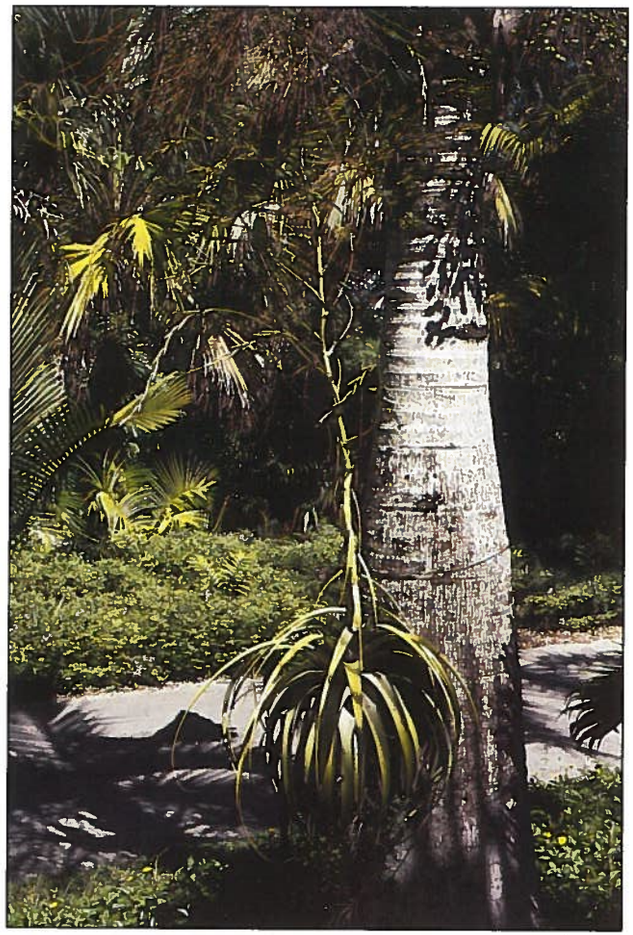
T. utriculata's monocarpic habit has interesting theoretical implications. These plants have limited reproductive resources so that vegetative propagation and sexual reproduction create conflicting demands. A plant can produce many vegetative offshoots or abundant seeds but not both. Not surprisingly, the giant wild pine's reproductive effort is twice that of polycarpic tillandsias (Bennett 1988, MS).

T. utriculata has other morphological features consistent with its big-bang reproductive strategy. Its inflorescence, which may branch up to 4 times, is the largest of Florida's native species. The expansive architecture increases the probability that its wind-blown seeds will disperse to suitable germination sites. Plants produce an average of 56 fruits (Bennett 1988) and each has more seeds (a mean of 237) than Florida's other tillandsias. Mean seed yield for each *T. utriculata* inflorescence is thus 13,272 seeds. It is more remarkable that large individuals may produce more than 25,000 seeds. Bountiful seed production helps assure survival of species that do not propagate vegetatively. These seeds also are highly capable of movement. In wind tunnel experiments, they dispersed farther than 15 other bromeliad species (Bennett 1988, MS).

Another distinguishing feature of the giant wild pine is its white flowers. *Tillandsia usneoides* has chartreuse petals. A red form of *T. flexuosa* occurs in the Everglades National Park but Florida's other tillandsias possess purple petals. Moths may pollinate white-flowered wild pines but, as with most other bromeliads, detailed pollination studies are lacking.

The large tank formed by the leaves of *T. utriculata* often traps much water and debris. Knowing this, Florida's indigenous people, including the Seminoles, used the plant as an emergency water source. Water trapped by the rosette also may be an important microhabitat for arboreal organisms such as tree frogs, particularly during extended dry periods.

Giant wild pines occur in many Florida plant communities including mangroves, cypress swamps, and even pine flat woods. They are most abundant,



Author

Fig. 16
Tillandsia utriculata Linnaeus, 1743, growing on a bottle palm *(Hyophorbe lagenicaulis)* in Fairchild Tropical Garden, Miami, Florida

though, in live oak hammocks. *Tillandsia usneoides, T. recurvata, T. fasciculata, Polypodium virginianum,* and *Encyclia tampensis* are common epiphytic associates. Large trees may support hundreds of plants. Often branches supporting these epiphytes break or plants become dislodged during storms. Some fallen individuals take root and survive, especially on sterile white sands that are free of competitors. In exposed sites these terrestrial plants will flower but seeds never germinate nor grow to adult size on the ground.

Giant wild pines grow throughout southern and central Florida. There are records of the plant from southern Georgia (Smith and Downs 1977; Duncan and Kartesz 1981) representing widely disjunct populations. *Tillandsia utriculata* also occurs in the Caribbean, Mexico, Venezuela, and Central America, a distribution shared by many Florida bromeliads. Its size, occasional terrestrial growth, and

[cont. on page 271]

Workshop on Bromeliad Research: Current Topics and Directions

An informal conference was held on 13-14 December 1988 at the Dept. of Botany, the Smithsonian Institution, Washington, D.C. to review current research on bromeliads, to identify areas of bromeliad biology and systematics in need of future research, to discuss and recommend the use and support of living research collections of bromeliads, and to discuss priorities and coordination of field work. This summary includes the major topics discussed. The names of the scientists who attended are listed in part I.

I. Current and planned research.

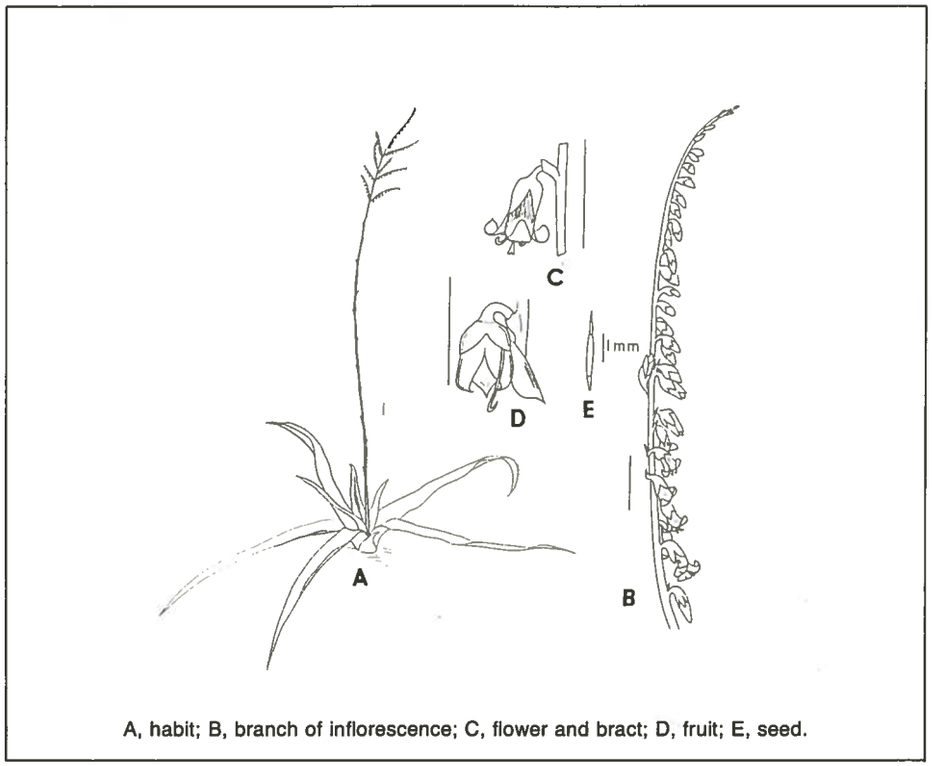
David H. Benzing (Oberlin College) has just completed a book, *The Biology of Epiphytes* (Cambridge University Press). He is now working on the relationship between tank bromeliads and associated fauna, the impact of bromeliads on the nutrient cycling in tropical forest, and the anatomy and ecology of carnivory in *Brocchinia.*

Gregory K. Brown (University of Wyoming) is examining petal scale ontogeny in the family as a source of information on generic limits, especially in Tillandsioideae. He is also conducting a study of floral characters, investigations of chromosome evolution, and a revision of *Tillandsia* subgenus *Phytarrhiza;* the latter two projects in collaboration with Amy Jean Gilmartin and Harry Luther. Flavonoid studies of *Tillandsia* are being pursued in collaboration with Dennis Clark and studies of floral development in *Hechtia* with John Utley. Student research to be overseen will include chromosome cytology of *Cryptanthus* and its intergeneric hybrids with *Billbergia,* as well as the nature of plicate staminal filaments in *Tillandsia.* He is also working on a revision of *Tillandsia* subgenus *Pseudo-Catopsis,* and has developed a database of bromeliad taxa in the herbaria at The Marie Selby Botanical Gardens and the San Diego Natural History Museum.

W. Dennis Clark (Arizona State University) is cooperating with Greg Brown on the flavonoid chemotaxonomy of *Tillandsia* subgen. *Phytarrhiza,* especially in terms of cladistic analysis. In cooperation with Mike Clegg at the University of California at Riverside work is planned on gene sequencing for higher level comparisons in the family.

C. Sue Gardner (Corpus Christi Botanical Gardens) is working on problems in the taxonomy of *Tillandsia* subgen. *Tillandsia,* and is interested in the delineation of species boundaries by the use of molecular techniques.

Amy Jean Gilmartin (Washington State University) (deceased), in addition to cooperative projects with Greg Brown and Harry Luther, was working on anatomical, morphological, and molecular studies of the subfamily Bromelioideae



A, habit; B, branch of inflorescence; C, flower and bract; D, fruit; E, seed.

Fig. 17
Fosterella penduliflora. From: Smith & Downs (1974) fig. 73.

very rapidly. By September, the parent plant was looking decrepit, and I removed it to allow the pup to expand. It grew very quickly, and bloomed the following year. Two pups this time emerged from the adult.

In the previous paragraph, I called the seeds of *F. villosula* dustlike. That is an exaggeration; they are easily visible to the eye, and like pitcairnia seeds are rodlike. Two people who grow the species have told me that seedlings of this plant are often found growing in the pots of other plants, a tribute to the ease by which the seeds are spread and the toughness of the seedlings. The seedlings grew well on peat pellets, though somewhat slowly. At nine months of age, I removed them from the pellets and placed them on ground peat where they are growing rapidly. Now one year old, they average about half an inch across.

Not many species of *Fosterella* are available. Besides the two I mentioned, *F. schidosperma* has been offered through the Seed Fund, but I have seen neither seed or plants offered of any other species in the genus. The lack of availability is not surprising; they are quietly attractive plants with little flash to them.

Walnut, California

The Florida Bromeliads: *Tillandsia utriculata*

[cont. from page 266]

monocarpic reproduction make *T. utriculata* an unusual member of the Sunshine State's bromeliad flora.

LITERATURE CITED:

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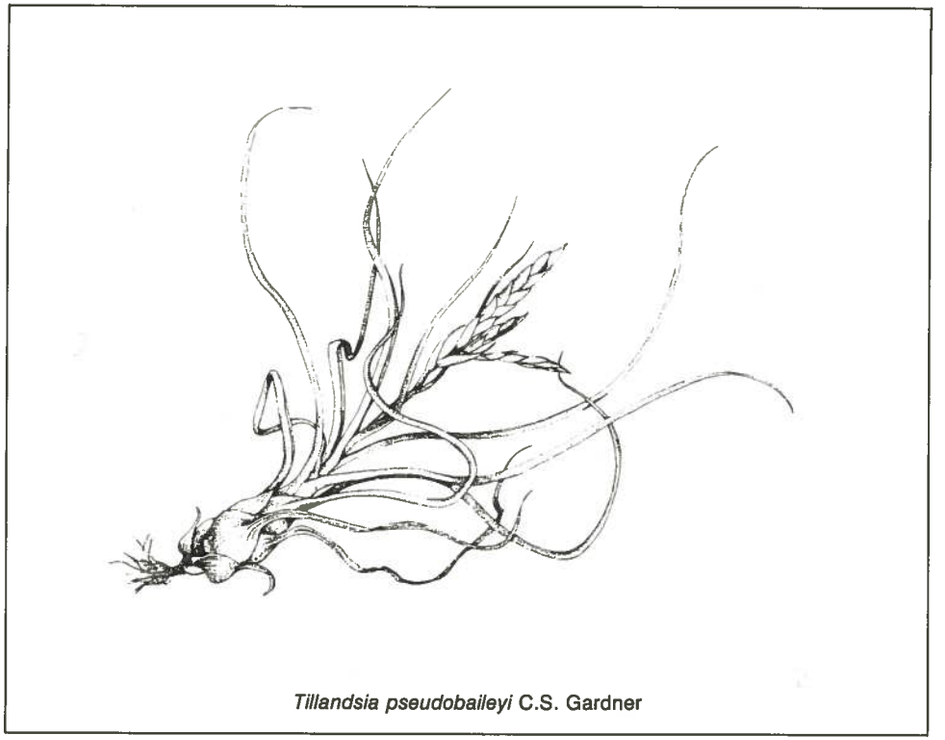

Tillandsia pseudobaileyi C.S. Gardner

C.S. Gardner

A Comparison of *Tillandsia macdougallii* with *T. oaxacana*

[continued from page 250]

bulbous and the leaves secund. All of the material from these locations that I examined, despite the evident differences, fit the description of *T. macdougallii.*

Tillandsia oaxacana L.B. Smith also differs very much in size, structure of the leaves and inflorescence. It sometimes grows together with *T. violacea.* When the plants are not flowering it is hard to distinguish one from the other. *T. oaxacana* can also be very big, with very narrow, green leaves. Between Oaxaca and Puerto Angel we found small plants with more coriaceous leaves appearing grey because of the close-lying scales. The inflorescence can be nearly straight with very short stem, or descending with a distinct scape. The inflorescence may be ellipsoid or nearly cylindrical (fig. 6). Nevertheless, they fit the description of *T. oaxacana* L.B. Smith (syn. *T. atrococcinea* Matuda).

After all that, I was glad that I had solved the riddle.

As both species come from elevations of 1,600–3,500 m, they are not easy to cultivate. During the summer, when they are hanging in shady trees, there is no problem in the German climate. In winter, however, many bromeliad lovers have difficulties since they cannot keep the plants cool enough indoors. We have two glasshouses, one for cactus and cool plants that is heated only to 8 degrees Centigrade (about 40 degrees Fahrenheit) and we have no problems with the plants. They grow and flower pretty well since they like it cold. (Near Río Frio we saw *T. macdougallii* covered with 15 cm of snow).

Stuttgart, West Germany

Corrections for *Journal*

Volume 39, no. 4,

p. 153, line 8 and p. 156, line 6: 8/80 is the collection number.

p. 154, line 1 and p. 156, last line: the author's name is Ernst Zecher.

p. 155, lines 10 and 11: . . . *T. bourgaei* differs from *T. ilseana*. . . .

p. 156, Reference omitted: Schill, R.; Dannenbaum, Ch.; Jentzsch, E.-M. Untersuchungen an Bromeliennarben. Beitr. Biol. Pflanzen 63:221-252; 1988.

Volume 39, no. 5

p. 230, column 2 (1989): change membership expenses total to read $9,600.00 and correct following totals.

column 3 (1990): correct total expenses to read $52,206.00

Regional Reflections

A Bromanian Tale

Zaiga Hartnett

They met one sunny afternoon. Over the months they discovered a mutual attraction for plants, gardens and other living things. On touring his garden, she delighted in the bromeliads he had planted under the trees—on touring her garden, he noted she had one or two as well (bromeliads that is).

They decided to marry, and celebrated their nuptials in a garden, which by now housed a small shade-house that he had built where they planned to raise their "children," of whom they already had several.

And then it all started. They itemised plants they had acquired, debating the pros and cons with their limited knowledge—invested in the few books readily available on what was rapidly becoming their favourite subject—joined a study group to further whet their appetites for these fascinating wonders both small and large.

On weekends they scoured nurseries on the off-chance of finding yet another charmer to join their rapidly expanding family. They discovered there were actually growers of these wonderful addictive things, so when they were flush, they visited them to purchase yet another charmer. Occasionally, they even stooped to poring over discarded mothers at the local op-shop (alias council dump), where the odd one was rescued to produce a fine young pup, after being plied with T.L.C.

Their family grew and grew. He extended the shade-house. The children needed much more room, and the lawn was not really necessary. They dabbled in seedlings, so a nursery was erected to protect the tender young shoots. Old mothers were now planted out to enjoy their retirement on terraces at the back of the block and, slowly but surely, bromels "appeared" in other parts of their garden as well. Trees and rocks and garden beds all wanted their share.

Now, some three years and twenty-six genera later, having firmly decided on a *really* large family, they saved their pennies for the '89 Melbourne Conference; and with a bit of LOTTO luck, watch out South America!

All in all, a love affair; and their *Puya raimondii* still has a long way to go—approximately one hundred and forty-nine years!!

Reprinted from Bromeletter, *The Bromeliad Society of Australia, Inc.*
March-April 1989

An Experiment with Turface

Edward L. Sard

After reading Rozalia Rau's article in the March 1988 *Bromeliana,*[1] I became intrigued with Turface[2] and decided to test its merits as a potting medium. I discovered that the Long Island source mentioned (Green Gardens Nursery) carried three different sizes: small, regular, and large. After consulting with Rozalia, and with the help of my brother, who lives in Suffolk County, I obtained a modest quantity of the regular size. It is best described as clay rock in the form of small pebbles.

Since my retirement, I have concentrated on growing bromeliads from seed. One of the most prolific seed germinators (just about 100% germination) is *Aechmea distichantha* var. *schlumbergeri.* My first one was potted in an individual pot early in 1985 and was repotted in my regular bromeliad potting mix in December 1985. By September 1987 the plant had reached about 30 inches in height and I mistakenly thought it might be ready for Florel treatment. A strong solution (16–1) was used and the Florel acted as a fertility drug: as many as a dozen offsets.

By the time I had obtained the Turface in April 1988, there were three pups of equal size sufficiently large to be used in an experiment. One was potted in my regular mix (equal parts of tree fern fiber, peat moss, and vermiculite) supplemented with generous dashes of bone meal and Zoodoo.

The second pup was potted in straight Turface. The third offset was planted in a mix consisting of 50% Turface and 50% regular mix. All had very few roots and were planted in 3-inch square plastic pots and placed on capillary mats under a flumeric bulb near an east window so that they also received some sunlight.

All three pups were planted on April 18, 1988. The first one was about 10 inches tall, the second was 8 inches high, and the third was about 9 inches high.

All plants were sprayed briefly every day (with a few drops of Schultz's 10-15-10 liquid fertilizer added to the water) and they are watered weekly with fertilizer, a drop of Superthrive and Physan 20 added to the water. Care was taken to water all three experimental plants thoroughly, with added attention given to the pup planted in straight Turface.

First observations were noted on June 9th, about seven weeks after potting. The only one to show marked growth was the pup potted in straight Turface. This

1. [Reprinted in *J. Brom. Soc.* 38:220-222; 1988.]
2. [Turface is sold by OFE International, Inc., P.O. Box 161302, Miami, FL 33116, tel. 305-253-7080. Ask them for a price list.]

offset had grown a full inch while the other two grew only ¼ inch. However, the other two showed much more leaf spreading, especially the offset potted in my regular mix.

The second observations were made on July 13th. The pup planted in straight Turface grew an additional ½ inch while the other two grew another ¼–½ inch. All three were well rooted.

The final observations were noted on September 30th, about 5½ months after the original potting. The pup potted in my regular mix was now 11½ inches tall (a 15% growth since potting) with excellent conformation. The pup in straight Turface showed no additional growth, but the 9½ inch height represented a 19% growth since potting. The plant potted in 50% Turface and 50% regular mix now showed the greatest growth, a height of 11 inches. This was a 22% increase since potting. It was a fuller plant.

What are we to conclude from this brief experiment? I believe that Turface is easy to use, but one must pay special attention to watering as Turface by itself cannot absorb water on a capillary mat. Turface can be effective added to a regular mix to make it more friable. Certainly a more thorough test over a longer period of time with many more plants of different species is needed to make a more reliable evaluation.

Shortly after acquiring the Turface, I decided to plant a *Tillandsia bulbosa* in 100% Turface. While I watched it closely on one of my germinating capillary mats, it received ample water and appeared to be doing well. However, when it was moved to a crowded top bench, it was unattended. It was not surprising, therefore, that when inspection took place in about five weeks, the plant was beyond salvaging. This emphasizes the need for constant watering when 100% Turface is used—a problem that does not arise when Turface is mixed 50–50 with a regular porous mix.

Reprinted by permission of the author from Bromeliana, *the New York Bromeliad Society, Inc., November 1988*

An Open Letter to the Members of The Bromeliad Society, Inc.

One of the great tasks for any voluntary group lies in selecting, recruiting, training and retaining leaders. As chairman of the Nominations Committee for the current term and as an individual who has never held a national office in the bromeliad world, I consider it my personal challenge to assemble a slate of capable, hardworking candidates for the positions that will open during my term.

I need your help! If you want to serve and don't know how to volunteer, call or write me and I'll help you find a niche.

I need your help! If you have been dissatisfied with past or present officers then get in there and show us how. Call or write and I'll make sure you get on the ballot.

I need your help! If you know of a member who can help do the work that it takes to keep this society on track, nominate them. Call or write and I'll show you how.

From personal experience I can tell you that I have never failed to collect rewards for my volunteer efforts. The rewards are an ever increasing circle of friends and associates who share similar interests. The rewards are the feeling of accomplishment after the job is done. The rewards are the learning of new skills through tackling challenging tasks and seeing them through.

There is something that each of us can do, there is somewhere and some time for each of us to serve. If we fail to act when needed, if we fail to serve when called, the society will not prosper. If the society does not prosper each of us will have less opportunity to enjoy each other and the plants that have brought us together.

You need your help! Anything you can do to help me with my job as nominations chairman will benefit us all. Let's do it!

Dutch Vandervort
25 Encinal Place
Ventura, CA 93001
805-643-2506

NEW DIRECTORS, 1990-1992

California: Dutch Vandervort, 25 Encinal Pl., Ventura, CA 93001.
Florida: Geoffrey Johnson, 3961 Markham Woods Rd., Longwood, FL 32750.
International: No votes were cast.
Louisiana: T.M. Calamari, 1016 Rosa Ave., Metairie, LA 70005.
Texas: Clyde Jackson, 3705 Shadycrest, Pearland, TX 77581.

Nominations Open for the 1990 Election of Directors

Nominations are now being requested for the office of director of The Bromeliad Society, Inc. for the term 1991–1993. Directors are elected by region.

Regions having openings for the 1991–1993 term:

California	2 directors
Central	1 director
Florida	1 director
International	2 directors
Northeast	1 director
Southern	1 director
Western	1 director

Who may nominate? Any voting member of the society who resides in a region for which there is an opening may nominate a candidate for an opening in that region.

Who may be nominated: A nominee must: 1. be a voting member of the society currently and have been a voting member for the three consecutive years prior to nomination. 2. reside in the region for which nominated. 3. not have served two consecutive terms as a director immediately preceding nomination. 4. agree to being nominated. 5. agree to serve as a director if elected.

Procedure for nominating: 1. obtain the consent of the prospective nominee and verify compliance with the qualification criteria. 2. airmail nominations to the chairman of the Nominations Committee between 1 January and 18 March 1990, inclusive. Telephone nominations will be accepted through 15 March but must be confirmed in writing. 3. supply with each nomination the full name, address and telephone number of the nominee, the position for which the nomination is being made, local society affiliations (if any), and a brief biography of the nominee.

Responsibilities of the nominees: 1. to accept the nomination and agree to serve if elected. 2. to attend all annual Board meetings at own expense (attendance commitment not required of nominees outside the United States). 3. to carry out the duties of director as outlined in the current bylaws of the society. 4. to provide to the nominator the information listed in item 3 of the preceding paragraph.

Mail nominations to: Dutch Vandervort
Chairman, Nominations Committee
25 Encinal Place
Ventura, CA 93001
Telephone: 805-643-2506

Workshop on Bromeliad Research: Current Topics and Directions *[continued from page 268]*

II. Areas of bromeliad biology and systematics in need of future research.

Several topics appeared repeatedly in discussions on areas in need of research, and have been grouped here along with specific taxa mentioned as cases in point.

A. **Taxonomic and systematic research.** Generic limits in Tillandsioideae (esp. *Tillandsia* and *Vriesea)* and in Bromelioideae (esp. *Aechmea)* are in special need of study. More critical investigations of floral characters, e.g., petal scales (including ontogeny) may help to resolve these generic boundaries. Studies on species limits and phylogenetic relationship in *Cryptanthus, Aechmea, Billbergia,* and *Neoregelia* were cited as examples of genera in need of work. The outgroup of Bromeliaceae is still unsatisfactorily resolved but should be investigated using molecular techniques.

B. **Evolutionary process research.** The following topics were suggested for study: the effect of diversification of pollination systems on the evolutionary divergence of generic and species groups; selective pressures and diversification in stigma types with respect to floral biology; relationship between speciation and pollinators, e.g., *Pitciarnia* in Jamaica; pollination biology, with emphasis on field observations; breeding systems, particularly the evolution of dioecy in *Catopsis, Androlepis, Dyckia, Cottendorfia* and *Hechtia,* and autogamy in tillandsioides and pitcairnioids.

C. **Field research.** 1) Taxa and/or geographic areas suggested as being under-collected and in need of study include northeastern Brazil and southern Bahia; the western Andes in northern Ecuador and southern Colombia; the states of Guerrero and Oaxaca in Mexico.

2) The Smithsonian Institution's BIOLAT programs in Peru, Bolivia and Ecuador need workers to identify the epiphytic flora of the site. Opportunity exists for vegetational mapping, monitoring long term changes, and in situ biological studies.

3) Other projects and sites for bromeliad research include the LTER (Long Term Ecological Research) site at Luguillo, Puerto Rico, La Selva Biological Station in Costa Rica, and the Biological Diversity of the Guianas (Smithsonian).

D. **Laboratory research.** Molecular techniques (proteins, nucleic acids) should be applied to questions that are difficult to answer with more conventional methods. Suggested for study is inter- and intraspecific genetic variation, particularly among species complexes (e.g., Mexican *Tillandsia utriculata/maculata* and *capitata/brachycaulos* complexes)

III. Use and support of living research collections.

A. The Marie Selby Botanical Gardens will grow living material received from field collectors. It was suggested that the workshop participants correspond with the Board of Trustees and the executive director of the gardens to generate continued support for upkeep and expansion of the collection.

B. Pacifica Gardens in California was suggested as a repository for high elevation taxa. Collectors should contact Michael Rothenberg at Pacifica to make arrangements for housing field collections, and were urged to continue correspondence to maintain interest.

IV. Other discussion topics.

Other discussion topics included conservation and concern about possible restrictions; research support; identification of herbaria with significant bromeliad holdings; herbarium data base management and the need for computerized standardization in anticipation of a worldwide system.

[Further information including the addresses of the conferees may be obtained from Dr. W. John Kress, Dept. of Botany NHB-166, Smithsonian Institution, Washington, D.C. 20560. His telephone number is 202-357-1506.]

What's In a Name?

I was talking bromeliad talk with a friend and he asked me if I had *Neoregelia* 'Imp'. I said I hadn't even heard of it, so he said it was rather good and he would send me a pup. In due course it arrived. I planted it and it soon grew and eventually flowered and it sure was a nice plant.

Then I had a visitor from Australia and I remarked to him how attractive it was. He burst out laughing and told me he had imported it a long time ago and it arrived without a name. He marked it "Imp" for his own benefit so he knew it was an imported one. Now, here it was over here and known to all and sundry as *Neoregelia* 'Imp'. So that's one way of naming a plant.

Bea Hanson
From Bromeliad Society of New Zealand Bulletin, *May 1988.*

Advertising space in the *Journal of the Bromeliad Society* is available at the following rates:

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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.

. . . . . .

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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
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Choose one
☐ Renewal
☐ New Member

Amount Enclosed $_____

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

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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. Henker

Guzmania rubro-lutea Rauh is a native of central Ecuador where it was found growing as an epiphyte kept moist, however, in the spray of the celebrated waterfall of the Río Coca on the road from Baeza to Lago Agrio at 1300 meters altitude. This species was first described by Dr. Rauh in *Bromelienstudien,* VIII. Mitteilung: 20-23; 1979.

Calendar of Shows

11-12 November — Caloosahatchee Bromeliad Society Standard Show and Sale, "Bromeliad Hoedown." Lee County Garden and Activities Center, Fort Myers, FL. Entries and judging, Friday 10 Nov., 10 A.M. to 12 noon. Show hours: Saturday, 9 A.M. to 6 P.M.; Sunday, 10 A.M. to 4 P.M. Betty Ann Prevatt, 813-334-0242.