Journal of The Bromeliad Society

VOLUME 48 • MARCH–APRIL 1998 • NUMBER 2

Journal of the Bromeliad Society

Vol. 48, No. 2 March–April, 1998

Editor: Chet Blackburn, 720 Millertown Road, Auburn, California 95603.
Telephone and Fax: 530-885-0201, E-mail: blackburn@neworld.net

Editorial Advisory Board: David H. Benzing, Gregory K. Brown, Pamela Koide, Thomas U. Lineham, Jr., Harry E. Luther, Robert W. Read, Walter Till.

Cover photographs. Front: *Tillandsia mixtecorum* Ehlers & Koide, a new species described in this issue in text beginning on page 52. Photograph by Pamela Koide Back: ×*Pitinia* 'Coral Horizon', Text on page 64. Photograph by Anne Collings.

CONTENTS

The *Journal,* ISSN 0090-8738, is published bimonthly at Orlando, Florida by the Bromeliad Society International. 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 International. **Please address all correspondence about articles and advertising to the editor.**

Subscription price (in U.S. $) is included in the 12-month membership dues: single–$25.00, dual (two members at one address receiving one *Journal*)–$30.00, fellowship–$40.00, life–$750.00 Please add $8.00 for international surface mail, except for life members. For first class mail add $10.00, for airmail please add $18.00.

Please address all membership and subscription correspondence to Membership Secretary Carolyn Schoenau, P.O. Box 12981, Gainesville, FL 32604. Telephone 352-372-6589

Back Issues: All single copies $4.50 1st class postpaid to ZIP addresses, other countries $5.50 airmail postpaid; per volume $20.00 to ZIP addresses, $25.00 to other addresses, 3rd class or surface postpaid. Order back issues from BSI Publications, c/o Sally Thompson, 29275 N.E. Putnam Rd., Newberg, OR 97132, USA; make checks drawn on U S. banks, bank drafts, or money orders payable to B.S.I. Prices are subject to change.

Printed by Fidelity Press, Orlando, Florida.

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

You are hereby notified that the **annual general meeting** of the Bromeliad Society International will be held at the Wyndham Greenspoint Hotel, Houston, Texas at 8:30 a.m. on July 6, 1998 to consider such business as may be brought to the attention of the BSI Board of Directors. All business matters must be sent in writing to the president at least 60 days before the meeting (Bylaws, Art. VII, part 2). The **annual meeting of the Board of Directors** will be held immediately after the general meeting. The following schedule applies:

1) 90 days before the meeting: Officers, directors, and committee chairmen shall send budget requirements and financial accounting to the treasurer. (Standing Rules 3 and 6).

2) 30 days before the meetings: Officers, other directors, and committee chairmen shall submit annual reports to the president and send copies to each officer and director. (Standing Rules 3 and 6).

3) 30 days before the meetings: the president will mail the agenda to each officer and director. (Standing Rule 3,par. 2g).

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

Any BSI member who has an issue or issues that they wish to be brought before the board, may either attend the general members meeting preceding the Board of Directors meeting or convey those issues to their local Director who is a member of the board. A list of all Directors, the regions they represent, and their current addresses can be located on page 95 of this issue of the JOURNAL.

Jerry Raack, President
472 Greenhollow Drive
Pataskala, Ohio 43062

Tillandsia mixtecorum, A New Species from Oaxaca, Mexico

Renate Ehlers and Pamela Koide

***Tillandsia mixtecorum* R. Ehlers & P. Koide, sp. nov.** (front cover, figures1-2).

A *Tillandsia schusteri* Rauh characteribus sequentibus differt: planta sine stolonibus, rosula ampliora, inflorescentia spicis patentibus composita, ampliora, bracteis florigeris sepala multo superantibus, ecarinatis, latioribus et minus lepidotis.

Typus: Mexico, Estado Oaxaca, inter pagum Pueblo Viejo et Pico de Yucuhiti, prope Santa Maria Yucuhiti, 2500 m s. m. saxicola in scopulis, *leg. P. Koide et A. Lau Jr. 9110294,* anno *1991,* floruit in coll. R. Ehlers Januario 1997 (Holotypus: MEXU, Isotypus: WU).

Type. Mexico. Oaxaca: between Pueblo Viejo and Pico de Yucuhuiti near Santa Maria Yucuhuiti, saxicolous on a steep rock wall, 2500 m s. m. *leg. Pamela Koide and Alfredo Lau Jr. 9110294,* October 1991, flowering Jan. 1997 in cultivation by Ehlers.

The plant is known only from the type locality. (holotype: MEXU, isotype: WU)

Plant growing saxicolous, stemless, usually with no off-shoots at the base, to 35 cm high, flowering to 65 cm high, to 85 cm wide, few leaves (20–25) form a spreading rosette. **Leaves** to 60 cm long, coriaceous, green but densely covered with gray, subappressed scales. **Sheaths** to 15 cm long, 6–9 cm wide, elliptic, conspicuous, adaxially concolorous with the blades and gray lepidote, abaxially slightly brown-green, finely brown lepidote. **Blades** 3–4 cm wide at base, to 40 cm long, narrowly triangular, narrowed into a subulate recurved apex, green, densely and finely appressed gray lepidote, abaxially nerved and with asymmetric keel. **Scape** erect, about equaling the rosette, to 18 cm long, stout, to 1.5 cm in diameter, concealed by few, foliaceous, imbricate, scape-bracts with recurved blades, the lower ones as long as the inner rosette leaves, the upper ones to 25 cm long. **Inflorescence** erect, much surpassing the rosette, 20 to 30 cm long, to

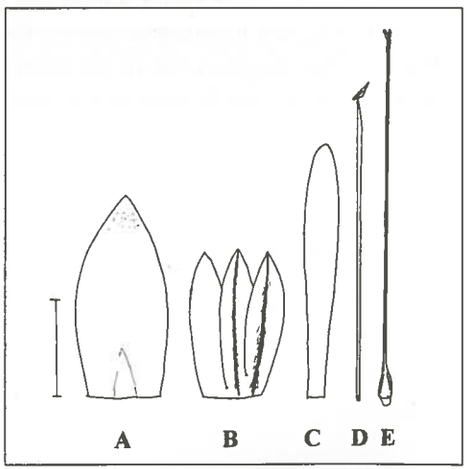

Figure 1. Renate Ehlers

mark: 1 cm, A, floral bract; B, sepals; C, petal; E, filament; F, style.

Figure 2. Pamela Koide

Tillandsia mixtecorum flower

20 cm in diameter, lax, bipinnately composed of 7–13 spikes which spread at an angle of 45–70°, internodes ca 2 cm; rachis 10–7 mm in diameter, green, glabrous. **Primary bracts** shorter than the spikes, the sheaths about half as long as the spikes and enfolding the narrow abaxial side of the spike, red or gray, the blades of the lower ones like the scape-bracts and surpassing the spikes, the upper ones only acute without blade. **Spikes** 7–12 cm long, 1.5–2 cm wide, lanceolate to narrowly elliptic, acute, complanate, with a stout 1 cm long stipe with a large (to 3.5 cm long) bicarinate sterile bract adjacent to the rachis, composed of 7–13 distichous, densely imbricate flowers, rachis not visible, glabrous, nearly straight, flowers sessile, odorless. **Floral bracts** 3.5–4.6 cm long, 1.7–2.4 cm wide, elliptic, acute, sometimes very slightly carinate, red, abaxially glabrous except the sparsely lepidote apex, adaxially densely brown punctulate lepidote (the apical half more so). **Sepals** 2.8–3.1 cm long, 8–9 mm wide, oblong, acute; the anterior ones 2 mm, the posterior ones 4 mm connate and subulate-carinate; apical 2–10 mm of keel red, basal part thickened and green, membranaceous, nerved, abaxially yellow-green, glabrous, adaxially reddish-brown punctulate lepidote. **Petals** 5.5 cm long, 7 mm wide, yellow-green, whitish at base, ligulate, their tips slightly revolute, corolla throat closed around the filaments. **Stamens** exserted. Filaments 6.3–6.6 cm long, in two series of unequal length, 0.8 mm wide, greenish, white towards base, thin and twisted, anthers 3.5–4 mm long, 1 mm wide, fixed 1/4 from base, light brown, pollen golden yellow. **Style** to 1 cm surpassing the filaments, to 6.8 cm long, 1 mm wide, yellow-green, stigma 2.5 mm long, 1.8 mm wide, lobes nearly erect, Type II of Brown & Gilmartin (1984), **Ovary** 5 mm long, 2.5 mm wide at base, conical, greenish.

The plant cannot be identified using the keys presented by L.B. Smith in Flora Neotropica, vol. 14, pt 2 (1977). *Tillandsia mixtecorum* seems to be related to *Tillandsia schusteri* but differs by the following characters: Plant without stolons; rosette wider, leaves wider; inflorescence composed of wider, not erect but spreading spikes; floral bracts much surpassing the sepals, ecarinate, wider and less lepidote.

The plant is being named to honor the Mixtec Indian people, who live in the mountainous region of Oaxaca. It was here that Alfred B. Lau Sr. initially discovered the plant on Nov. 5th, 1990. He had sent several photos to Renate Ehlers, whose enthusiasm for the plant was aroused. Pamela Koide and Alfredo Lau Jr. went to the location and recollected the plant from the steep rock walls on which it grows. I (Ehlers) was delighted to receive some of the plants in 1991. Pamela Koide flowered some plants and we were surprised because we had guessed that it would have violet flowers, but the plant had yellow-green flowers. In December 1997 all three of my plants came in to flower in our collection in Stuttgart. Since the light is not very good during winter in Germany the inflorescence color is not as bright as it should be, but it is nevertheless a wonderful addition to the genus *Tillandsia.*

ACKNOWLEDGEMENT

Our thanks to Dr. Welter Till, University of Vienna for his assistance in the Latin diagnosis.

REFERENCES

Brown, D. K. & Gilmartin, A. J. (1984): Stigma Structure and Variation in BROMELIACEAE - Neglected Taxonomic Characters. Brittonia 36 (4): 364-374.

Rauh, W.: Akademie der Wissenschaften Mainz, Bromelienstudien, 18. Mitteilung, Nr. 58, p.37 -41, 1986.

Smith, L, B. & Downs, R J. Tillandsioideae (Bromeliaceae) in FLORA NEOTROPICA, Monograph 14, part 2 Hafner Press, New York, 1989.

The Bromeliad Cultivar Registry

Don Beadle

A Preliminary Listing of All Known Cultivar and Grex Names for the Bromeliaceae was printed by the Bromeliad Society in June 1991. This list collected and organized all the known data on bromeliad cultivar names available to that time. The list was also a required first step toward the preparation of a *Bromeliad Cultivar Registry,* a requirement of the ICNCP (International Commission for the Nomenclature of Cultivated Plants). The Bromeliad Society International is the designated IRA (International Registration Authority) for Bromeliaceae. The "Registry" is nearing completion and will be ready for distribution at the 1998 World Conference in Houston.

[continued on page 59]

A Systematic Revision of *Cryptanthus:* Major Results

Ivón M. Ramirez M.[1] **Photography by the Author**

Cryptanthus is endemic to southeastern Brazil, where its members range from Paraiba in the north southward to Rio de Janeiro, with one species in Goiás State. Habitats include wet forests, restingas, caatingas, and campos rupestres, from sea level to 2000 meters of elevation.

I choose to revise this genus because of its exceptional low chromosome number, its tendency to andromonoecy (male and bisexual flowers), and its controversial phylogenetic position, besides its taxonomic problems. Here, I summarize evidence that bears on the study of the origin of the reduced chromosome number, the taxonomy, and phylogenetic consideration of the genus *Cryptanthus* (Ramirez, 1995 for more details on the objectives and methods of this project).

Classification.

I currently recognize 45 species and the same two subgenera originally proposed by Mez in 1896. My investigation indicates that additional characters beyond those proposed by Mez (1896) exist as geography and ecology distinguish these two subgenera.

Subgenus *Cryptanthus* with five sections is defined by the presence of andromonoecious plants, simple erect stigmas (with lobes spreading and fimbriate margins), flowers with tendency to be odorless, petals oblong or narrow elliptic, and usually curved outward exposing anthers and stigma, pollen with reticulate surface and few seeds per fruit (ca. 8). Members occur from 0 to 700 m, in wet forests, restingas (scrub vegetation along the coast), and caatingas (sclerophyllous vegetation), in the states of Rio de Janeiro, Espirito Santo, Minas Gerais, Bahia, Sergipe, Pernambuco, Paraiba, and Goiás. Leaves of these species possess a succulent central section attributable to a many-layered hypodermis.

Subgenus *Hoplocryptanthus* with four sections is defined by hermaphrodite plants, with simple erect stigmas (with lobes very short and almost connate, forming a truncate stigmatic surface), flowers tend to be fragrant, campanulate or almost flat, petals are orbicular or wide elliptic, anthers and stigma usually included, pollen with a smooth or finely reticulate surface, and numerous seeds per fruit, in some species (*C. schwackeanus* Mez) up to 40 per fruit. Members inhabit wet forests from 700 m up to "campos rupestres" (high altitude grasslands on rocky outcrops) at 2000 m, in the states of Minas Gerais and especially Espirito Santo.

[1] Centro de Investigación Cientifica de Yucatán, A. C., A. P. 87, Cordemex, Mérida 97310 Yucatán, México

Figure 3.
Cryptanthus warren-loosei Leme: Note the bisexual flower is larger than the male flower in the same individual: This plant is a clonotype. (Subgenus *Cryptanthus*)

Figure 4.
Cryptanthus latifolius Leme: Note the flowers with rounded petals and almost hidden stamens and stigma (Subgenus *Hoplocryptanthus*)

How to recognize *Cryptanthus* from similar groups in Bromelioideae.

Members of the subgenus *Cryptanthus* are easily separated from any other bromeliads because of the presence of bisexual and male flowers. When sterile, they are harder to recognize but this problem sometimes is extended to many other bromeliads because most of the differences among genera are in floral structures.

Species of subgenus *Hoplocryptanthus* (those with hermaphrodite flowers) pose the greater problems for taxonomists, because they are easily confused with other taxa such as *Orthophytum* with nidular inflorescences, but *Orthophytum* species usually have colored inflorescence bracts, non-fragrant flowers, and petals with appendages. Members of *Wittrockia* can be distinguished from those of *Cryptanthus* by the presence of petal appendages and usually colored inflorescence bracts and odorless flowers as well as a water impounding rosette. *Cryptanthus* can be distinguished from members of *Bromelia* with nidular inflorescences because the former lack a staminal crown, have concolorous inflorescence bracts and usually have fragrant flowers.

Similarly, *Cryptanthus* can be distinguished from members of *Neoregelia* subgenus *Neoregelia* because *Cryptanthus* have unappendaged petals, usually have fragrant flowers, always white petals (never blue), no water impoundment formed by the bases of the leaves, and are usually smaller plants. Finally, some members of *Cryptanthus* can be confused with some in *Nidularium* subgenus *Nidularium,* but the members of this last group have colored inflorescence bracts.

Origin of the low chromosome number.

The genus *Cryptanthus* is distinguished from the rest of Bromelioideae, by a combination of morphological features and by a unique low chromosome number (n=17 or 18) compared to the rest of the family (n=25). Brown and Gilmartin (1989) 2 proposed a mechanism to explain how n=25 originated in the family, where *Cryptanthus* chromosome number (l) could have been originated by a descending aneuploidal process (i.e. reorganization of nuclear DNA in lower number of chromosomes resulting in larger chromosomes on average; or (2) being an ancient tetraploid in the proposed evolutionary scheme of the family (see diagram on Brown and Gilmartin, 1989).

These two hypotheses were tested by comparing the nuclear DNA amount of species with n=17 or 18 *(Cryptanthus)* with other species with n= 25 (other Bromelioideae). The quantification of nuclear DNA was determined by flow cytometry, a technique that implies the treatment of the nuclear DNA with a fluorescent compound that, when irradiated with a laser at a specific wavelength, caused the fluorescence of the compound, giving an estimation of the amount of the nuclear DNA.

[2] Brown adn Gilmartin (1989) proposed an evolution scheme based on chromosome number and putative relationship between Bromeliaceae with the Rapateaceae instead of Velloziaceae (Terry et al., 1997).

My results (Ramirez, 1996) partially suggest that the origin of the low chromosome number in *Cryptanthus* arose as some numerous chromosomes condensed to reduce formerly higher numbers (descending aneuploidy). Nevertheless, some species of *Cryptanthus* show high nuclear DNA amounts, indicating the possibility of endoreplication processes or polyploid races.

Phylogenetic considerations.

Several studies suggest that Cryptanthus is primitive (seeds: Gross, 1988; septal nectaries: Böhme, 1988) but others characters suggest a derived trend (tendency to andromonoecy, fragrant flowers, CAM metabolism (Medina, 1990 among others), and the results of the origin of the low chromosome number by descending aneuploidy (Ramirez, 1996).

Brown and Gilmartin (1989) proposed that if the origin of the low chromosome number of *Cryptanthus* is by polyploidization of two ancestral lineages originating a paleotetraploidy *(Cryptanthus),* it would had been better to place the genus in its own subfamily, Cryptanthoideae.

Considering all evidence at hand and the results of my investigations, I propose that *Cryptanthus* should remain in the Bromelioideae and be considered as a very derived genus, because of the tendency to andromonoecy, the suggested origin of chromosome number by descending aneuploidy, the presence of CAM, the simple-erect stigma, and the tendency to present fragrant flowers. *Orthophytum* is the most closely related group, as indicated by a cladistic analysis (Ramirez, 1996) and by results of DNA analysis (Terry *et al.,* 1997).

ACKNOWLEDGMENTS

This paper was extracted from my Ph.D. dissertation. My thanks go to the members of my committee, Mick Richardson, Charlotte Taylor and Victoria Sork. Also thanks to Harry Luther, Gregory Brown, Marcelo Senna, and Elton Leme for comments on this research. For financial support my gratitude goes to the Department of Graduate Students at the Missouri Botanical Garden, Elizabeth A. Baltzer Foundation, Graduate School of the University of Missouri - St. Louis, Fundación Gran Mariscal de Ayacucho, International Center of Tropical Ecology, the Bromeliad Society International, M. B. Foster Bromeliad Identification Center, Cryptanthus Society, Bromeliad Guild of Tampa Bay, Federated Gardens Clubs of Missouri. Special thanks to David Benzing, German Carnevali, William Fritz, Bob Whitman, Roberto Kautsky, Pedro Naohum, Mauricio Andrade, Miguel Gorgulho, and Eliana Ramos. For their help in the DNA analysis, to the Department of Agricultural Sciences, University of Illinois, Champaign, especially to D.P. Biradar.

LITERATURE CITED

Böihme, S. 1988. Vergleichende Untersuchungen zu Bau, Lage und systematischer Verwertbarkeit der Septalnektarien von Bromeliaceen. Tropische und Subtropische Pflanzenwelt (62): 125-274.

Brown, G. K. and A. J. Gilmartin. 1989. Chromosomes numbers in Bromeliaceae. Amer. J. Bet. 76(5): 657-665.

Gross, E. 1988. Zur Morphologie der Bromeliaceen- Samen unter Beriicksichtigung systematisch taxonomischer aspekte. Trop. und Subtrop. Pflanzenwelt 64: 415-625.

Medina, E. 1990. Eco-fisiologia y evoluci6n de las Bromeliaceae. Bol. Acad. Cien. (Córdoba,) 59: 71-100.

Mez, C. 1896. Bromeliaceae. In: a. de Candolle (ed.), Monographie Phanerogamarum 9: 1-990. G. Masson, Paris.

Ramirez, I. 1995. Why is a systematic revision of Cryptanthus needed today? J. Cryptanthus Sec. 10(2): 24-30.

Ramirez, I. 1996. Systematics, phylogeny and chromosome number evolution in *Cryptanthus* (Bromeliaceae). Ph.D.Thesis, University of Missouri-St. Louis, Missouri, USA.

Terry, R. G., G. K. Brown and R. G. Olmstead. 1997. Examination of subfamilial phylogeny in Bromeliaceae using a comparative sequencing of the plastid locus ndhF. Amer. J. Bot. 84(5): 664-670.

Mérida, Yucatán, Mexico

The Bromeliad Cultivar Registry

[continued from page 54]

The Registry has been expanded to include, wherever possible, a description of the cultivar as well as additional references to sources of published information such as articles and illustrations. Much help is needed in obtaining additional information and descriptions, especially on the work of the earlier hybridizers such as Hummel and his contemporaries. I am able to prepare special lists by hybridizer, genus, etc. of the work already done to send to any of you willing to review and add your input. The Preliminary List contained a large number of names that have appeared in print but about which nothing is known. I can send a list of those names to anyone willing to review them. The lists can be sent by regular mail or preferably by e-mail. Time is running out as the final "Registry" will need to be ready for printing by early June, 1998 in order to be available at the World Bromeliad Conference in Houston in July, 1998.

Since the "Registry" is a listing of cultivar names, unnamed crosses will not be included. Most or our collections contain worthwhile cultivars known only by their formula. Many of these are very much deserving of a name and I urge their hybridizers to name them and register the names in time for inclusion in the "Registry". The ICNCP allows anyone to name unnamed crosses with the permission of the hybridizer. If the hybridizer is unknown, deceased or is no longer interested, you may name the cultivar provided that you register as much information as possible regarding its parentage and origin and provide a description. This informal information should be sent to me prior to June 1, 1998 in order to be included in the Registry. Following publication of the official "Registry" any new cultivars will have to go through the formal registration process by submitting forms and photographs to the BSI Registrar, Ellen Baskerville.

The "Registry" will provide an informational foundation for working with bromeliad cultivars, both species and hybrid, and will only be as valuable as you help to make it. Your help is needed and appreciated.

973 First Dirt Road, Venice, FL 34292
(941) 485-1096 Billberg@worldnet.att.net

What Does the BSI do For Me?

Jerry Raack

This is a question often asked, but sometimes not adequately answered. A BSI membership is a lot more than just a subscription to the JOURNAL OF THE BROMELIAD SOCIETY. There are few if any growers of bromeliads anywhere in the world, be they BSI members or not, that have not benefited from the existence of the BSI. At the risk of "preaching to the converted," I'd like to point out some of these benefits that are often taken for granted. In so doing, I've incorporated material from an article by Chet Blackburn[1] several years back in the newsletter of the Sacramento Bromeliad Society and have expanded upon them. The major benefits are:

1. **The Bromeliad Journal.** The first benefit to come to the minds of most people is the aforementioned JOURNAL OF THE BROMELIAD SOCIETY. It alone should be enough to justify membership. Those who have seen it know it to be one of the best publications put out by any plant society. Published 6 times yearly, each issue contains 48 pages of articles on growing bromeliads, visits to bromeliad habitats, the latest information on bromeliad research and cultural information, introduction of new species and hybrids, and illustrated with more than 70 exquisite color photographs a year.

2. **Bromeliad Research.** The BSI provides direct grants and financial assistance to botanists and others to encourage research involving the bromeliad family. The findings are published in the JOURNAL where they are not only made available to growers for practical application, but have a ripple effect by also providing fodder for future studies by researchers not receiving BSI financing.

3. **The Bromeliad Identification Center.** The BSI provides financial support to the Mulford B. Foster Bromeliad Identification Center at Marie Selby Botanical Gardens, where important work in bromeliad taxonomy takes place. Anyone who has been around bromeliads for any length of time knows that Harry Luther, Director of the BIC, has been a major force in bromeliad taxonomy. He has not only had an impact in the technical arena, but has also been instrumental in clearing up taxonomic problems of plants under cultivation that had been misidentified in the past. The BIC provides plant identification services to both scientists and hobbyists and periodically publishes a listing of all known species along with the correct spelling of the plant names. Without BSI funding, it is unlikely that the BIC would continue to exist, or to have even existed at all.

[1] Blackburn, Chet "Why BSI?" THE BROMELIAD NEWS (Newsletter of the Sacramento Bromeliad Society) Vol 5 (10). November 1995.

4. **Cultivar registration.** The BSI is the official body of registration for all bromeliad cultivar and hybrid names. It periodically publishes listings and information on all known cultivars and hybrids, and provides the registration process for growers and hybridizers to register their new plants. Thousands of cultivars and hybrids are already on the market and new ones are constantly appearing. Without a body such as this to keep track of them and maintain archives of information about them, naming of cultivated plants would soon degenerate into total chaos.

5. **Bromeliad Conservation.** The influence of a worldwide organization that is a recognized authority on bromeliads is much greater than that of any individual or local group. As the world's population continues to expand and destroy local ecosystems, conservation, and the BSI's participation in conservation activities, will become increasingly important. Bromeliad conservation will take on a much greater significance to the BSI in the future than it does today.

6. **Establishment of judging standards.** Almost everyone agrees that a common set of standards should exist for judging bromeliads. However, almost no one agrees on just what those standards should be. The BSI has published a *Handbook for Judges, Exhibitors, and Affiliates,* conducts judge training, certifies accredited judges, and provides several awards to further standardization so that awards earned in Miami mean the same thing as an award in San Diego, Houston, Wellington, or Caracas.

7. **Seed Fund.** Bromeliad seeds, often of very hard-to-come-by species, are available through the BSI seed fund at a very nominal cost.

8. **Slide Library.** The BSI maintains a series of slide programs available for use as programs at local plant societies.

9. **Publications.** The BSI publishes and/or sells a number of books and publications on bromeliads that would otherwise be unavailable. (The Cultivar listings and Bromeliad Glossary are examples)

10. **Web Site.** The BSI has established a web site on the internet where growers from around the world can obtain information about bromeliads, the BSI and BSI affiliates, participate in round table discussions on a wide variety of topics relating to bromeliads, see photographs of common bromeliads for identification purposes, find out where to obtain plants and related products, and find out what events are upcoming in any part of the world.

11. **World Conferences.** Every other year, a world conference is held and attended by growers from around the globe. On the educational and social side, the conferences feature informative seminars, tours of local private homes and commercial growers, plant sales by growers from around the country (where new varieties are inevitably introduced), a large judged

show, plant raffles, rare plant auctions, and the normal trappings of most conventions and conferences such as banquets and cocktail parties.

Social and entertainment functions are not the only events taking place at world conferences. The BSI Board of Directors meets to formulate policy, establish a budget, and do long range planning. The Cryptanthus Society conducts their board meeting and a rare plant raffle there. Affiliate newsletter editors meet to compare notes. Affiliates have an opportunity to meet directly with the BSI Board of Directors. Judges training schools are also conducted. In short, much of what happens at the affiliate level throughout the following years has its origin at the world conference. .

Most importantly, however, the conferences provide a place for people with similar interests from around the world to make contact and establish friendships.

Those are all tangible benefits provided by the BSI, but what about some of the intangible benefits? We've all heard people say that they do not take advantage of any of the benefits listed above, so why should they pay BSI dues? The fact is, however, that they do use those benefits above...perhaps not directly, but they derive benefits through others that have used them directly.

If your affiliate has a plant table or a plant sale, you undoubtedly have a number of plants in your collection that arrived there somehow as a result of the BSI. Perhaps someone who ordered it from the seed fund grew it from seed, perhaps it was purchased by someone at a world conference that later shared offspring on a future plant table, or perhaps it was purchased through the mail through one of the advertisers in the JOURNAL. Perhaps it was hybridized by a local grower who learned how to do it, or was inspired to do it, by an article in the JOURNAL. How many plants ended up in your local area because a local member became interested in the plant and sought it out as a result of a picture in the JOURNAL? You are almost certain to have plants in your collection that can be traced back to the existence of the BSI, and that is true no matter what part of the world you happen to live.

Those growers who were around in the early days of the BSI know that it was common to find a plant sold under one name in one area being sold under another name in another area. This still goes on of course, but not nearly to the degree it did before the BIC and the BSI JOURNAL. Where would you learn about the existence of new species if they were not published in the JOURNAL? The JOURNAL is not the only publication in which new species are described of course, but I think it's safe to say that those published in the JOURNAL receive the most attention from hobbyists. Most of the other publications are more technical in nature and/or have limited distribution.

Every affiliate has a few local gurus upon which they depend for bromeliad knowledge. Most of these gurus will admit that their knowledge was either

gained or enhanced by articles in the JOURNAL or a seminar at a world conference, or through visiting or correspondence with other distant gurus who they became aware of through some activity of the BSI. To cite an example, are there many Australians who think it is mere coincidence that people such as Olwen Ferris, Grace Goode, William Morris, Derek Butcher, and many other knowledgeable individuals happen to be longtime BSI members?

Has your affiliate ever had an out of town speaker? Where did you learn about him/her? Have you ordered bromeliads through the mail? How did you learn about the dealer? Have you ever noticed how many articles that appear in your local newsletter are reprinted from the JOURNAL, both past & present? Anyone taking the time to take a close look at all the activities of their local affiliate will come to realize that the BSI is far more pervasive than they originally thought.

BSI programs do benefit everyone, and everyone should participate to ensure that those benefits continue. To do this, we need more voting members. Many people may not realize that they are already BSI members by virtue of their belonging to a local bromeliad society that is affiliated with the BSI. All members of an affiliate are also automatically members of the BSI, but they are not voting members. Voting members are those who pay annual dues to the BSI and they are the one responsible for the benefits that everyone enjoys. They are the backbone of the society. They receive the JOURNAL, and beginning with the next world conference in Houston, voting members will receive a discount in conference registration fees. Additional discounts in other areas, such as publications, are currently under discussion by the board. They also receive the satisfaction of knowing that they are contributing to fulfillment of the purpose of the BSI. That is, to promote and maintain public and scientific interest in the research, development, preservation, and distribution of bromeliads.

Rest assured that any ideas you may have to improve any aspect of BSI programs or operations will be welcomed by its officers, directors, and committee chairmen. You will find their names at the back of each issue of the JOURNAL. The Board of Directors is committed to improving relationships between the BSI and its affiliates and is working very hard accomplish this. However, the foundation upon which everything rests is the voting member! Anyone who has an interest in bromeliads should be a BSI voting member. As Director Don Beadle has frequently stated in his talks to affiliates, "There are many reasons to belong to the BSI, but the main reason is - It's the right thing to do!"

Pataskala, Ohio

Cultivar Corner

Ellen Baskerville[1]

Major change in nomenclature of bromeliads is gathering momentum as taxonomists begin to split or abolish certain genera and elevate subgenera to the level of genus. Having enjoyed relative stability of bromeliad nomenclature for a long period, it is with some concern to bromeliad lovers that names are changing too rapidly, and it is very hard to keep up with these changes. This note pertaining to cultivars is not to debate this issue, but to help keep growers informed as to how these name changes affect their registered plants.

One example of a major change came when *Pepinia,* the subgenus of Pitcairnia, was re-established as a genus in 1988 (Varadarajan 1988). Jim Irvin of Fort Myers, Florida made the cross *Pitcairnia rubronigriflora* × *Pitcairnia corallina* and registered the name, *Pitcairnia* 'Coral Horizon' in 1994. Soon after registration, it was noted that the pollen parent, *Pitcairnia corallina* was now a *Pepinia,* and Jim was given the option of combining the two genera into a bigeneric name according to the rules of the International Code of Botanical Nomenclature. He chose the name ×*Pitinia,* a combination of the first syllable of *Pitcairnia* and the last three syllables of *Pepinia.* This name was first introduced in the Bromeliad Society International cultivar registration supplement "Cultivar/Grex Registrations for June 1991-May 1996" and distributed at the World Bromeliad Conference in Orlando, Florida, in July 1996.

In November 1997, Diane Molnar of Fort Myers, Florida, entered her specimen plant of ×*Pitinia* 'Coral Horizon' in the Fort Myers Caloosahatchee Bromeliad Society Show and won the Mulford B. Foster Best of Show award. This Best of Show plant is the "Cultivar Corner" feature for this issue. A photograph of the plant appears on the back cover.

Further updates on name changes of cultivars will be noted here in this "Corner." An introduction to some of the hybridizers and their registered cultivars will begin in subsequent issues of the Journal.

LITERATURE CITED

Varadarajan, G. S. and A. J. Gilmartin. 1988. Taxonomic realignments within the Subfamily Pitcairnioideae (Bromeliaceae). Systematic Botany 13(2): 294-299.

[1] BSI Cultivar Registrar, Marie Selby Botanical Gardens, 811 South Palm Avenue, Sarasota, FL 34236, U.S.A.

World Conference BSI Judges School

Valerie Steckler

On Wednesday, July 1. 1998 in Houston, Texas at the World Conference, BSI Judges School III will be taught by Valerie L. Steckler and Rita Beeler. Cost of the school is $20.00. All students who took School II in Orlando, FL in 1996 passed their point scoring examinations, and are eligible to take this School. Those who have not taken any previous schools may start with this school. The topics discussed will be; Qualifications, Appointment and Accreditation of Judges, Genera *Ananas, Aerococcus, Catopsis, Guzmania, Hohenbergia, Neoglaziova, Vriesea,* and Exhibits, Decorative and Educational.

Students will need a personal copy of the *The Handbook for Judges, Exhibitors, and Affiliates*. These are available from Sally Thompson, BSI Publication Sales Chairman, 29275 N.E. Putnam Road, Newberg, Oregon, 97132 at a cost of $20, or they may be purchased at the World Conference. However it would be better to buy the book beforehand and read the school materials that will be taught.

These schools at World Conferences were established about twelve years ago to accommodate those members who desired to become judges, but lived in an area where there were not sufficient students to support a school. An example would be Dee Dee Bundy of Massachusetts, who took all her schools at World Conferences and was the first person to receive her Judges Certificate and pin at Orlando. She is a valuable asset and would not be a BSI Judge if it were not for the existence of Conference Schools. Another example is Ana Rousse of Venezuela, who will complete the school series at Houston. At the present time it takes10 years to complete the five schools held at World Conferences. However, we always need new people as attrition occurs with judges, as it does with everything else.

Those able to bring plants for the school are implored to do so. While I know people in the Houston area will be busy with their show plants and performing whatever jobs they volunteer for, please take the time to bring any of those plants mentioned above that are not quite ready for the show table, for they would be very welcome at the school. That "not-so-perfect *Vriesea*" for the show table would be wonderful material for judging school students learning to point score. Remember that this school is being taught on the same day that entries are being received. Lend us any of your plants that exceeded the limit. We'll take good care of them and return them. We also welcome any slides depicting the genera being studied, which will be returned, if requested. If you have any questions about the schools, please call or write me.

1143 Paradise Lane
Ferriday, LA 71334
318-757 - 7346

The Extraordinary *Quesnelia tillandsioides*

Harry E. Luther **Photograph by the Author**

Quesnelia tillandsioides was first described as a species of *Billbergia* by J.C. Baker in 1889. The description was based on a specimen collected by the great bromeliad discoverer A. Glaziou and deposited at the herbarium of the Royal Botanical Gardens, Kew. Baker noted that his new species was "very distinct". In 1892, C. Mez transferred Baker's chimeric species to *Quesnelia*. There is no report of the plant being recollected in the wild.

Obviously very extraordinary conditions are required to flower this odd plant as it has been little noted in the literature this century. Luckily extraordinary conditions prevailed in Florida this past first of April as a plant at the Marie Selby Botanical Gardens displayed several inflorescences to the amazement of all present for the event (figure 5).

Figure 5.
Quesnelia tillandsioides came into flower on April 1 last year.

A full account of the history and psychology behind *Quesnelia tillandsioides* was presented by Dr. L. B. Smith in the Bulletin of the Bromeliad Society, vol. 16, pp. 4,5, 1966.

This species is probably not available in the nursery trade and if offered should not be purchased.

Marie Selby Botanical Gardens
Sarasota, Florida

The Great Bromeliad Hoax

Lyman B. Smith

Practically every branch of science or art has had a hoax perpetrated on it by some practical joker trying to confound the critics or by some charlatan avid of unearned reputation or profit. A skillful Dutch artist discovered lost masterpieces for Hitler's benefit, but after the war had to placate his vengeful colleagues by disclosing them as forgeries. In his early years, Fritz Kreisler embarrassed hostile critics by much the same stratagem with supposed manuscripts of famous musicians.

In science, we have tales which are impossible to verify, like the schoolboy's "humbug" composed of parts of several different insects, down to clear cut modern cases like the Piltdown Man of the anthropologists. One of the early American ornithologists is said to have confounded a cocky student by mounting the head of one bird on the body of another, and in great grandfather's day the geographers uncovered a fake discovery of the North Pole.

In botany also there have been hoaxes, though the majority of them are geographical where it is difficult to draw the line between an honest error from mixed or lost labels and intentional deceit. I ran into one such case of chicanery in my early curating at the Gray Herbarium, when I was told to remove every specimen of a certain collection from southern Brazil.

A dealer in scientific books had had a sideline in plant specimens, and one set had sold out quickly with a demand for still more. Ingeniously if not too ethically, the dealer had taken specimens not so popular and relabeled them as coming from southern Brazil. They sold and were mounted and filed in a number of herbaria, but when botanists came to study them suspicions grew rapidly into conviction. Of two Tillandsias in this lot, one grew no nearer than the West Indies and the other was limited to Mexico.

However, the bromels have had one hoax that was based on fantasy instead of geography. In his first great treatment of the Bromeliaceae in the "Flora Brasiliensis" in 1892, Mez described and illustrated *Quesnelia tillandsioides.* In herbarium specimens deposited in the Kew and Berlin herbaria, the scape and inflorescence are indistinguishable from those of *Quesnelia liboniana,* while the leaves are like those of a *Tillandsia* or some Brazilian species of *Vriesea.* Mez cited *Quesnelia tillandsioides* again in his first complete monograph of the Bromeliaceae in 1896, but in 1906 Tietze came out with the startling news that *Quesnelia tillandsioides* consisted of a flowering shoot of *Quesnelia liboniana* pushed into a rosette of a *Tillandsia* or *Vriesea.* My guess would be *Vriesea poenulata,* which is also illustrated in the "Flora Brasiliensis" and collected by Glaziou, the same man who produced *Quesnelia tillandsioides.*

Thus the means of this hoax are fairly easy to explain, but the motive is more difficult. At first it might seem to be an accident in assembling broken specimens, but while it might be possible for one specimen, two are hardly likely. Besides Glaziou must have been much too familiar with living bromeliads to make such a mistake. Then why should he have risked a reputation as the greatest discoverer of ornamental bromeliads of his day for the sake of one curious but rather ugly species? Maybe Glaziou started it as a joke and then dared not reveal it after its appearance in the "Flora Brasiliensis". As it is, he left no explanation and the motive of the great bromeliad hoax must remain a mystery.

Smithsonian Institution, Washington, D.C., U.S.A.

Reprinted from the BROMELIAD SOCIETY BULLETIN, *16 (1): 4-5. Jan-Feb 1966.*

BOOK REVIEW

SELBYANA, Volume 18, Number 1

Lee Kavaljian

Volume 18, number 1, 1997 of SELBYANA, the journal or the Marie Selby Botanical Gardens, has several articles on the subject of bromeliads. Personal subscriptions to SELBYANA are available at $40 per volume for individuals, $60 for libraries and institutions, from SELBYANA, P.O. Box 1897, Lawrence, Kansas 66044-8897, telephone 1-800-627-0629.

Among the articles in this issue is "De Rebus Bromeliacearum II" by Harry E. Luther and Edna Seiff. It contains taxonomic and publication information for the bromeliad type specimens not included in, or not published until after the appearance of, the L.B. Smith and R.J. Downs Flora Neotropica monograph 14, parts 1-3, and Luther & Sieff, SELBYANA, Vol. 15, 1994.

Listed are publication sources, dates, country of origin and locations, as well as synonyms and basionyms. The format for the new information is directly comparable and supplementary to the previous publications. An alphabetically arranged index provides for easy references to any particular species. This compilation of taxonomic information has been much needed and will be very useful for everyone interested in the accuracy of nomenclature, taxonomy, and the attendant documentation.

In the same issue, there are three other articles on bromeliads. Another by Luther is on "Miscellaneous New Taxa of Bromeliaceae (XI). This article describes five new species in *Orthophytum, Guzmania, Pitcairnia* and *Tillandsia.* Luther is a co-author of "Chromosome Numbers in Bromeliaceae" in which

chromosome numbers are reported for forty-four taxa from the family. The third article is on enzyme patterns in terrestrial and epiphytic bromeliads as influenced by nitrogen source.

This issue of SELBYANA has much to recommend it to bromeliad enthusiasts.

Department of Biological Sciences,
California State University, Sacramento
Sacramento, California

Tillandsia guatemalensis in Ritual Adornment

Virginia Guess and Robert Guess
Photographs by Robert Guess

The awesome sight of thousands of bromeliads in full flower that greets a first time visitor to a tropical forest translates into an everyday experience for those who make their home in such enchanting places. In highland Chiapas, Mexico, indigenous inhabitants pass daily under majestic trees laden with epiphytes, many species of which need further botanical descriptions. While local Maya Indians may collect colorful inflorescences to sell for a mere pittance in the markets of nearby towns, they otherwise ignore these plants except for the few they incorporate into their traditional rituals. The use of bromeliads for seasonal decoration is occasionally mentioned in the literature, but little attention has been given to their cultural aspects or the relationship that native dwellers have with their plant world. In this article, we focus on the role that one species of Bromeliaceae plays in what we call "ritual adornment." The term describes those plants that indigenous people gather from their natural habitats and incorporate according to prescribed rules into their religious ceremonies.

Every twenty days, a select group of Maya Indians leave their remote villages to search the nearby mountains for a certain plant. In their Tzotzil language, they hold the ceremonial title of *cuch nichim,* those with a given task *(cuch)* to gather flowers *(nichim).* Appointed for one year by a *martoma* (a steward of ritual knowledge or a religious official), they must supply the floral arrangements required in the performance of centuries-old rituals. These men are seeking a plant they know as *tsajal ech',* a bromeliad growing in the forests that surround their communal lands in the Municipio of San Juan Chamula.

In the Tzotzil language, *ech'* is a generic expression referring to epiphytes, bromeliads as well as orchids. Only selective plants that factor into their cultural practices receive a more descriptive term differentiating them according to color, shape, or function. These Maya Indians award barely a handful of the numerous species of *Tillandsia* that flourish in their environs with a more specific

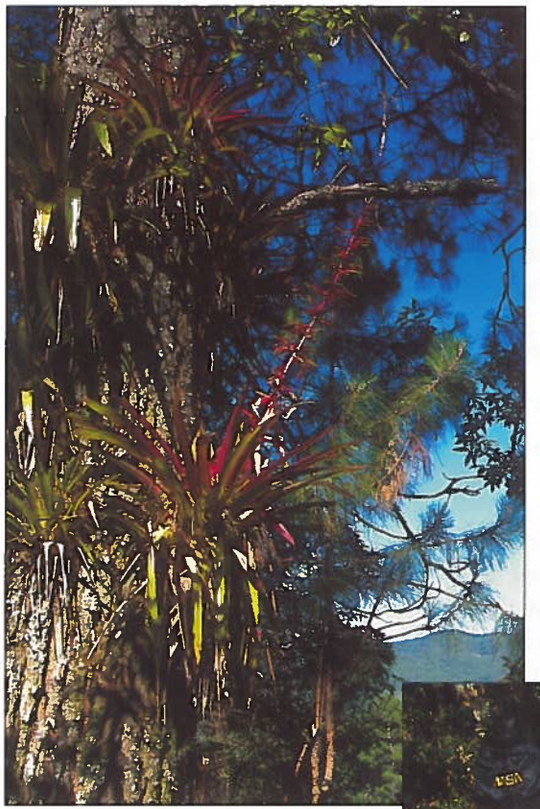

Figure 6.
Tillandsia guatemalensis in pine-oak forest of Highland Chiapas.

Figure 7.
Gathering and stripping dead leaves of *T. guatemalensis.* Note the basal offshoots (grass) being removed.

Figure 8.
Setting off on the long trek home heavily burdened with *T. guatemalensis.*

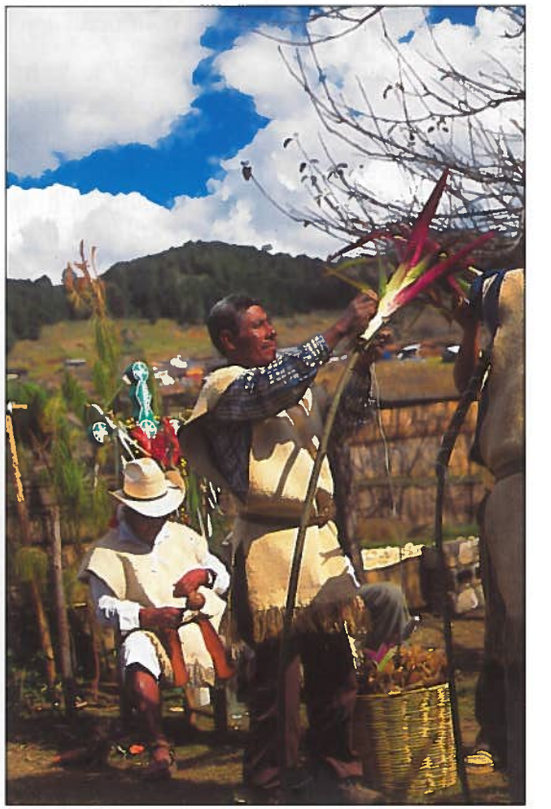

Figure 9.
Cuch nichim begins to adorn the arch with leaves from *tsajal ech'.*

designation. In this case, they add the modifying word *tsajal* to distinguish the red leaves of a bromeliad they use almost exclusively to decorate the arches that delineate ceremonial sites. In contrast, other Tzotzil-speaking Maya in the nearby Municipio of Zinacantán also utilize the inflorescence of this same species to adorn their house crosses *(krus)* and other shrines. They call it *krus ech'* to denote the use rather than the plant's distinctive leaf color.

Tillandsia guatemalensis L.B. Smith is the botanical name for *tsajal ech'* or *krus ech'*. *T. guatemalensis,* a prolific epiphytic species found in oak-pine forests of southern Mexico and throughout Central America, is one of the more common tillandsias of the Chiapas Highlands. This moderately large plant with twenty-five to thirty strap-like leaves, 30 to 40 cm long and 3 to 4 cm wide, thrives in the moist habitats of cloud forests located between 1100 and 3000 meters. The leaves form a dense crateriform rosette and change color from green, in low-light situations, to bright red or maroon when exposed to critical levels of sunlight. The tall, erect scape supports a multi-tiered inflorescence that often reaches over a meter in height. At maturity the bracts turn a startling bright red, and the branches of the inflorescence each bear from ten to twenty-five purple flowers. In spite of the striking inflorescence and colored leaves, however, the species has minimal horticultural value. Its method of reproduction, long developmental cycle, size at maturity, and the complex environmental conditions required for growth negate the plant's practicality in most commercial ventures.

T. guatemalensis is purported to be monocarpic, that is, it blooms once, develops, scatters seeds, and then dies without producing offsets. Field experience with these plants, however, suggests variations in this reproductive cycle, an observation that offers long-term study opportunities for students of this species. We have noted that in addition to producing seeds, many specimens of *T. guatemalensis* exhibit multiple axillary offsets as well as tiny offshoots or "grass" around their bases. Because of its abundance and accessibility in Chiapas, it is one of the primary bromeliads chosen for adornment by the Maya of San Juan Chamula. Established rules determine when they collect the plants, how they prepare the leaves, and when and where to use them. They often casually discard the dramatic inflorescence in deference to the leaves.

Just as the ancient Maya employed natural foliage to delineate a sacred locale, their descendants follow a similar custom. For example, the external appearances of the houses where the *martomas* of San Juan Chamula live are no different from other houses in the community: a simple one or two-room adobe structure with a tiled roof. What sets a house apart as a ceremonial site is a leaf-covered arch erected near the main doorway, and a room designated as a shrine to accommodate several statues of *santos* (saints). Inside, similar arches, only smaller in scale than the entry arch, surround the more important images. The *cuch nichim* construct these arches by binding several defoliated tree branches, 3 to 4 cm thick, shaped into a large arch by burying the ends 10 to 15 cm in the earth. Based on the Maya calendar that numbers the days according to a cycle of

religious events, these arches must be refreshed with new foliage from *T. guatemalensis* every twenty days.

The *cuch nichim* set off at dawn, often in groups of two to four, equipped with machetes, rope, tump-lines, and hemp bags to collect the fifty to one hundred plants needed to completely cover each arch. Once they reach the forests where large numbers of the plants grow, they climb the trees to the upper limbs to select those exposed to sunlight. They choose only the plants whose leaves have attained the proper dark red hue, and sever them at the base to free the holdfast from the tree. The plants fall to the ground below to be sorted, cleaned and gathered later. When the men have harvested the necessary number, they cut away the inflorescences, remove the dead or dried leaves, and bundle only the choicest plants into bags. They then transport their load via tump-line to the *martoma's* house for storage until the designated day to refresh the arches.

At the appointed time, the *cuch nichim* converge to complete their task. They first strip the arches of the withered leaves of *T. guatemalensis* and deposit them in a designated place where the dead foliage accumulates to be composted later. They then dismantle the freshly collected plants and wash the leaves in the presence of the *martoma* who chants to the accompaniment of music played on traditionally made drums, harp, and violins. They meticulously select only the finest and most colorful leaves, usually those that grow near the center. These are then reassembled one-by-one on the arch by securing each leaf with hemp cord starting at the center of the arch and working to the base. When finished, the interlocking leaves resemble the original leafy structure of *T. guatemalensis.*

The men repeat this process until the required number of arches are adorned, often from seven to nine. Incense and explosions from homemade rockets herald the completion of each arch. When all are ready, they are arranged in a row before the *martoma* for the final chants, incense, and fireworks before they are ceremoniously installed. Only the largest arch covered with the leaves of *T. guatemalensis* is visible in front of the *martoma's* house. The smaller ones are hidden from public view in the sacrosanct place maintained for the *santos.* At the end of the annual ceremonial cycle, all leaves used on the arches during the year are returned to the earth when the cornfields are prepared for the next planting.

Since these rites are performed in private, the process in which bromeliads are incorporated as adornment is rarely recorded. Often when non-indigenous plant collectors venture into these areas, they see only the completed arches covered with leaves without recognizing the significance behind the display. Contextual information when describing species provides clues to the availability and abundance of those plants prized for ceremonial use. In addition, familiarity with regional plant names facilitates communication with the Indians who frequently provide the knowledge and labor required to locate and gather desired specimens.

[continued on page 87]

Figure 10.
Martoma directs the adornment of the arches to the accompaniment of music. Note the wooden cross to his left decorated with *Tillandsia ponderosa* and *Tillandsia eizii*

Figure 11.
Bundles of *T. guatemalensis* on the way to market in San Cristóbal de Las Casas.

List of Ethnobotanical Use of Bromeliaceae

Rodrigo Rios A.[1] and Bridgette Khan[2]

Introduction

Ethnobotany is the study of an indigenous culture's use of plants. Following is a listing of uses of species of Bromeliaceae by peoples of the Americas. Sixty species in 14 genera are recorded as being used for food, medicine, fiber, construction, craft, fuel, tools, and ritual/mythical purposes. Most of the recorded uses are from Ecuador and Brazil.

The data was gathered from herbarium specimens at Selby Gardens, books dealing with medicinal plants, and journals such as Economic Botany and the JOURNAL OF THE BROMELIAD SOCIETY. Another source of information was the extensive taxonomic file collection of the Mulford B. Foster Bromeliad Identification Center at Selby Gardens. Information noted on herbarium specimen labels is followed by (in parenthesis) the collector, the collector's number, and the acronym for the herbarium where the specimen is deposited.

Aechmea bracteacta *(Swartz) Grisebach* Epiphytic and saxicolous.
PANAMA. The acid-sweet fruits are eaten raw or cooked and used to make alcoholic beverages. Long fibers are extracted from the leaves to make hammocks. **Local name:** izchu (Brucher, 1989).

Aechmea longifolia *(Rudge) L.B. Smith & M.A. Spencer* Epiphytic.
ECUADOR. Quechua people occasionally eat the fruit. (Bennett, 1995).

Aechmea magdalenae *(André) André ex Baker* Epiphytic and terrestrial.
MEXICO, Oaxaca. Chinantec people extract fiber for thread, cordage, mats, bagging, clothing, and hammocks. It is used to make paper and acts as a caustic for wounds. Thorns serve as needles and pins. **Local name:** Chinantec: gih-to-oh; Spanish: clavel, ishte, iste, ixtle, pita, pitaflora, vitaya; Zapotec: la-ga-ge-chi, ye-tsi-ro-tee (Schultes, 1941).

COSTA RICA. **Local name:** Cabecar dialect: tis, tis kolona (Hazlett, 1986).
PANAMA. Fruits are used to make alcoholic beverages. Local name: izchu

---

[1] RODRIGO RIOS is a graduate student at the Universidad Mayor de San Andrés in La Paz, Bolivia. He has extensive experience as a field assistant with staff of the University of Colorado and the Smithsonian Institution in their cooperative programs with the Museo de Historia Natural of Bolivia. His interest is in plant ecology and systematics with a focus on bromeliads.

[2] BRIDGETTE KAHN is attending the Institute of Technology in Melbourne Florida. She has experience working in a plant physiology lab and has assisted in research of tissue culture experiments and propagation of medicinal plants. Her special interest is in botanical garden collections, research, and herbarium management.

Both authors were spring 1997 interns at the Marie Selby Botanical Gardens.

PANAMA and COSTA RICA. Guaymi people dry the young leaf blade and scrape away the non-fibrous leaf tissue. Fiber is sun dried and used to weave bags, hammocks, etc. **Local name:** kiga (Brucher, 1989).
ECUADOR, Esmeraldas. Used as fiber, especially for fishing nets. **Local name:** san-tape *(A. Barfod 48386* at AAU, SEL). ECUADOR, El Oro. Fruits sold in market at Zaruma. **Local name:** piñuela *(J.A. Steyermark 3880* at F).

***Aechmea nudicaulis** (Linnaeus) Grisebach* Epiphytic and terrestrial.
BRAZIL. Fruit is used domestically as feed for poultry. Children suck fruit. (Reitz, 1983).

***Aechmea ornata** Baker* Epiphytic and saxicolous.
BRAZIL. Similar uses as *Aechmea nudicaulis.* **Local name:** gravata-de-lonca, monjola, chupa-chupa (Reitz, 1983).

***Aechmea zebrina** L.B. Smith* Epiphytic.
ECUADOR. Lowland Quechuas use as medicine: when the children get insomnia, the plant is cooked in water and administered as vaporization. **Local name:** Quechua: Angu-paja; (Bennett, 1995; Gallegos, 1988).

***Ananas ananassoides** (Baker) L.B. Smith* Terrestrial.
VENEZUELA, Amazonia. **Local name:** pina montanera (Smith and Downs, 1979).
BRAZIL, Roraima. **Local name:** ananai. BRAZIL, Para. **Local name:** gravata (Smith and Downs, 1979).
BOLIVIA, Santa Cruz. Fruit is used to prepare drink with sugar; the fruit eaten raw is a strong vermifuge. **Local name:** piñita (*Nee 35794* at NY).

***Ananas bracteactus** (Lindley) Schultes f.* Terrestrial.
BRAZIL. Forms hedges around houses in rural areas. (Leme, 1994). Pulp is consumed. **Local name:** carauata, (Martin, 1987). Ananas de cerca (Smith and Downs, 1979).
PARAGUAY. Tupi and Guarani Indians use cooked leaves as abortive medicine. Fibers serve in making hammocks and yarn. **Local name:** karaguata-ruha "tall growth" (Brucher, 1989).
ECUADOR, Chinborazo. **Local name:** piña agria, piña silvestre (*M. Acosta Solis 5317* at F).

***Ananas comosus** (Linnaeus) Merrill* Terrestrial.
BRAZIL, Para. Tikunas use immature fruit as an abortifactant in the first or second month of pregnancy. Fruit is grated or ingested with water. Abortion is said to occur one day after eating. **Local name:** Tikuna: chi-na'. Brazil, Amazonia. Fruit is used to combat dyspeptic flatulence. (Schultes and Raffauf, 1990).
ECUADOR, Napo. Fruit is eaten by Siona and Secoya Indians. **Local name:** kato insi, hal insi, miq insi; Spanish: piña, piña grande (*W.T. Vickers 174* at F).
HONDURAS. Garifuna make a flower and leaf decoction that is ingested for bites, stings, infections, cuts, and hemorrhage. **Local name:** Garifuna: yeiawa (Coe and Anderson, 1996).

GUADELOUPE ISLAND. Fleshy fruit is eaten as reported by Columbus on Nov. 4, 1493. **Local name:** Guarini: taino "noble fruit" (Brucher, 1989).
MEXICO. Recorded in 1553 to be consumed by Choco Indians as a fermented beverage. (Duke, 1970).
HAWAII, UNITED STATES. Hexagonal fruit sections are dried and strung into leis.
PHILIPPINES, CHINA, FORMOSA. Fine fiber is extracted and made into cloth. (Morton, 1977).
TROPICAL SOUTH AMERICA. Contains a protein-degrading enzyme, bromelain, used as a meat tenderizer. (Kopp, 1992).

***Ananas lucidus** Miller* Terrestrial.
VENEZUELA, Orinoco. Waika and Makiritare Indians use it to extract fibers. (Brucher, 1989).
ECUADOR, Bolivar. **Local name:** piña de cambrey (*M. Solis 6445* at F, US).
ECUADOR, Morona Santiago. **Local name:** chiu (J. Pajupet RBAE1007 at NY).
FRENCH GUIANA. **Local name:** pitte (Leal and Amaya, 1991).
BRAZIL, Para. **Local name:** curua. BRAZIL, Sao Paulo. **Local name:** curaua de Amazonia
VENEZUELAN GUAYANA, Orinoco. Small commercial planting by Hoti tribe. **Local name:** curaguata (Leal and Amaya, 1991).
Venezuela, Monagas. Commercial planting used to make breechcloths, strings, ropes, fishing lines and nets. (Leal and Amaya, 1991).

***Billbergia decora** Poeppig & Endlicher* Epiphytic.
PERU, Alto Amazonia. The black seeds are used to make necklaces. **Local name:** Achual Jivaro: kuwish (ikiamia kuwish) (*W.H. Lewis 11338* at MO).

***Bromelia antiacantha** Bertoloni* Terrestrial.
BRAZIL, Mato Grosso. Bororo Indians eat the fruit raw, boiled or cooked. Research has shown it possesses anthelmintic and antitussive properties. (Leme, 1994).

***Bromelia balansae** Mez* Terrestrial.
MEXICO. Cultivated for use as fences. Beverage is made from fruit. (Foster, 1950).
PARAGUAY, Chaco. Ayoreo women gather plants and place them directly into fire. Base of leaf is then eaten. **Local name:** dore (Schmeda-Hirschmann, 1994) .
PARAGUAY and ARGENTINA. Used as a living fence. "More efficient than barbed wire" (Wilson and Wilson, 1963).
BRAZIL, Espirito, Rio Grande do Sul, Santa Catarina. Used as living fences for cattle. **Local name:** banana do mato (forest banana) (Reitz, 1983). Brazil, Minas Gerias. **Local name:** macambira, caraguata (Mee, 1992).

***Bromelia chrysantha** Jacquin* Terrestrial.
SOUTH AMERICA. Pulp is eaten. **Local name:** piñuela (Martin *et al.,* 1987).
COLOMBIA. **Local name:** piñuela (Smith and Downs, 1979).
VENEZUELA. **Local name:** maya (Smith and Downs, 1979); Small scales are used to disinfect wounds. **Local name:** chiguichigui. (von Reis, 1982). VENEZUELA, La

Antillas. Fruits are baked and eaten. They are the main sustenance for four to five months of the year. They act as a replacement for bread. Fruit eaten raw causes dysentery due to irritation of the mucous membranes of the mouth. Shakes and beverages are also made from the fruit. It is also used as ornamentals, living fences, terrestrial markings and support for embankments. **Local name:** mada, casuca (Boza, 1990).

Bromelia hemisphaerica *Lamarck* Terrestrial.
HONDURAS. Soft fruit is used in beverages. **Local name** pinuela.
EL SALVADOR. **Local name:** motate, pina de cerca. (von Reis, 1982).

Bromelia nidus-puellae *(André) André* ex. *Mez.* Terrestrial.
COLOMBIA, Cauca Valley. Cultivated and used for defensive hedges. (André, 1883).

Bromelia pinguin *Linnaeus* Terrestrial.
BRAZIL. **Local name:** karatas (Foster, 1952).
GUIANAS. **Local name:** karwata (Foster, 1952).
COSTA RICA. Leaves are used for fiber. Young inflorescence are cooked as food and sometimes used to prepare beverages. **Local name:** Amu (Bribri); Bi-shku (Terraba) (Standley, 1938).
BELIZE. Leaves are pounded with salt to use as a poultice for sprains, fractures or broken bones. Extraction of fresh leaf has shown hypotensive activity in dogs and smooth muscle relaxant activity in rabbits. **Local name:** Spanish: piñuelo, Mayan: IxTot (Argivo et al., 1993).
WEST INDIES. Fruit is detersive and is used often to clean the mouth. Thin slices with sugar are frequently given to children with worms. (Howard, 1994).
EL SALVADOR, ACACIA and PERESKIA. Cultivated and grazed. Used as a fence for livestock. (*D. Dunn 23032* at USF).
CUBA. Juice of young fruit contains the proteolytic enzyme, bromelain that is used to digest and eliminate intestinal parasites. Ripe fruit juice is used as home remedies to treat fevers and ulcers of the mouth and throat and in large doses to induce abortion. Ripe fruit is eaten raw or cooked. Also used to prepare beverages. Tender new leaves (pollitas) and flower stalks (motate) are sold in markets. Serves as hedges. Indians plant around village for protection. Leaf fibers are used to make cloth, fishing lines, nets and string for tying bundles. (Nellis, 1994).
JAMAICA. Fruit is roasted, sliced and given to children, with salt as a vermifuge. (Morton, 1981).
GUATEMALA and YUCATAN. Young shoots are commonly eaten in drier zones when other vegetables are scarce. Fruit juice is used to make cooling drinks and vinegar. (Morton, 1981).
HONDURAS. Garifuna people make a decoction or poultice from the leaves, which is administered orally or topically for insect, snake or scorpion bites or stings. **Local name:** tidibu yeiawa (Coe and Anderson, 1996).
SOUTH AFRICA. Fruit used to cure scarlet fever. (Waterman, 1969).

Bromelia plumieri *(E. Morren) L.B. Smith* Terrestrial.
VENEZUELA. Brownish hairs at base of fruit are applied to burns and dried immediately after placing on burns. **Local name:** kurucujurro (von Reis Altschul, 1973). Flowers produce edible fruits from which a beverage is made. Fruit is used to adorn churches. (Oliva-Esteva and Steyermark, 1987).
EL SALVADOR. Fruit is cooked with sugar to make beverage, (atol de pina). Young shoots, (pollas), are cooked in soup and fried with eggs Fine fiber is extracted from leaves. Flowers and fruit are used for decoration. Also grown as a barrier or hedge. (Morton, 1981).
BRAZIL. Juice of crushed leaves is highly regarded as a febrifuge and vermifuge. Juice of raw fruit is antiscorbutic and antidiabetic. Fruit is made into a syrup (10 fruits boiled in 250 cc water with sugar added), which is taken as a diuretic 3 or 4 times daily for several days. Seeds are used for expelling intestinal parasites, especially in children. They are boiled and mashed (15 g seed in 200 cc of water), sugar is added in a small cupful taken 3 to 4 times per day. (Morton, 1981).
GUATEMALA. **Local name:** piñuela de cabeza de negro (Standley & Steyermark, 1958). **Local name:** piña, piñuela. Guatemala, Maya. **Local name:** cham, chom (Smith and Downs,1979).
COLOMBIA. **Local name:** piñuela. (Smith and Downs, 1979).
MEXICO, Sinaloa. **Local name:** aguama casuela (Smith and Downs, 1979).
BRITISH HONDURAS. **Local name:** ping-wing (Smith and Downs, 1979).
BRAZIL, Pernambuco. **Local name:** gravata (Smith and Downs, 1979).
MIDDLE AMERICA. **Local name:** anareke, anariki, camburito, carata, cham, ch'am ch'om, chigua-chigue, chihuichiue, chom, curibijul, curibjure, curujujul, cusuca, gravata de gancho, jocuiste, jucuiztli, karatas, macambira, maya, motate, nana de raposa, pina de cerco, pina de raton, pinuela de montana, piro, quiribijul, quirijujul, shiwishiwi, timbirichi, wild pinguin (Morton, 1981).

Bromelia trianae *Mez* Terrestrial.
COLOMBIA, Tolima. Pulp is eaten. **Local name:** pinuela (Martin, 1987).

Dyckia encholirioides *(Gaudichaud) Mez* Terrestrial.
BRAZIL, Sao Paulo, Parana', Santa Catarina, Rio Grande do Sula Used as living fences and to prevent dune erosion. **Local name:** gravata, bromelia (Reitz, 1983).

Greigia sodiroana *Mez* Terrestrial.
ECUADOR, Azuay. Fruit is sold in Otovalo market. **Local name:** piñuela (*W.H. Camp E-4704* at NY).

Greigia sphacelata *(Ruiz & Pavon) Regel* Terrestrial.
CHILE. Used to make crafts, baskets and thatched roofs. Leaves are boiled with detergent after spikes are removed; they are left outside for three nights to bleach and are then wet and polished. Fruit is edible and the beverage, chica, is made by smashing the fruit and sieving out the juice; with the juice the pudding, mazamorra, is made by blending with a starch. **Local name:** quiscal, chupon. (Villagram, 1984). Chile, Puerto Montt. Sweet edible fruit is sold at the market;

tastes like apple. Emulsified fruit is eaten. **Local name:** chupea , chupon (Smith and Downs, 1979; Martin, et al., 1987).

Guzmania eduardii *André ex Mez* Epiphytic.
ECUADOR, Carchi. Used as religious adornment. **Local name:** bicundohuis (*G. Tipaz 1305* at MO, SEL).

Guzmania globosa *L.B. Smith* Epiphytic.
ECUADOR, Carchi. Flowers covered with crystallized gelatin. **Local name:** flor de calnui (*G. Tipaz 1160* at MO, SEL).

Guzmania lingulata var. flammea *(L.B. Smith) L.B. Smith* Epiphytic.
ECUADOR, Esmeraldas. Used for stomachaches by drinking the cooled decoction of leaves in the morning before eating. **Local name:** ka-dju-dju-koro-tape (*L.P. Kvist 48377* at AAU).

Guzmania lingulata var. cardinalis *(André) L.B. Smith* Epiphytic.
ECUADOR, Carchi. Burned as incense to ward off evil spirits. **Local name:** bicunde guis (*G. Tipaz 1160* at MO).

Guzmania melinonis *Regel* Epiphytic.
ECUADOR. Quichua people make an aphrodisiac tea from the yellow flowers. (Bennett, 1995).

Guzmania multiflora *(André) André* ex *Mez* Epiphytic.
ECUADOR, Pichincha. Christmas arrangements. **Local name:** huicundo (*C. Ceron 1189* at MO, SEL).

Guzmania rosea *L.B. Smith* Epiphytic.
ECUADOR, Carchi. Used for treatment of psychological diseases (loco) by bathing in cold bath made with leaves. (*L.P. Kvist 48693* at AAU). **Local name:** teiug bicundi *(G. Tipaz 1431* at QCNE, MO).

Guzmania spp. Epiphytic.
ECUADOR. Arboreal primates feed on Guzmania inflorescences. Therefore, Shuar people hunt monkeys where Guzmania spp. abound. (Bennett, 1995).

Neoglaziovia variegata *(Arruda) Mez* Saxicolous and terrestrial.
BRAZIL. Important source of useful fiber for cordage and string. Production was industrialized during First World War. Used today by sertao dwellers to make household items such as ropes, bags and rugs. **Local name:** caroa, carua (Mayo, 1992).

Neoregelia pendula var. brevifolia *L.B. Smith* Epiphytic.
PERU, Loreto. Whole plant is boiled and decoction is drunk as a general tonic to feel better. **Local name:** Mayna Jivaro: kuwish (*W.H. Lewis 10917* at MO, SEL).

Nidularium innocentii *Lemaire* Epiphytic.
BRAZIL. Ka'apor Indians use entire stems for rope making. **Local name:** kirawa

(Balee, 1990). BRAZIL, Santa Catarina, Parana, Sao Paulo. Food for monkey. **Local name:** gravata-de-pax (Reitz, 1983).

Pitcairnia heterophylla *(Lindley) Beer* Epiphytic and saxicolous.
COSTA RICA. Infusion of leaves is relied on to control dysentery. (Morton, 1981).
MIDDLE AMERICA. **Local name:** broma, broma real, galo del diablo, spinillon (Morton, 1981).

Pitcairnia integrifolia Ker Gawler Terrestrial.
TRINIDAD. Men rub the waxy leaf coating in their venereal sores. **Local name:** citronnelle, du bord, de la mer (Morton, 1981).

Pitcairnia nigra **var.** ***pulchella*** *(Mez) H.Luther* Epiphytic and terrestrial.
ECUADOR, Azuay. Mules eat leaves; leaves also used for covering huts. **Local name:** shagraquihua (*J.A. Steyermark 52770* at F).

Pitcairnia pungens *Humboldt, Bonpland & Kunth* Saxicolous.
ECUADOR, Azuay. Infusion is made from ground root and is said to be good for kidneys and liver. **Local name:** quindle-sungana (*W.H. Camp 2172* at NY).

Pseudananas sagenarius *Camargo* Terrestrial.
ARGENTINA, Misiones. Cultivated. **Local name:** ihvira (Natalucci,1996).
MEXICO. Ripe yellow fruit is eaten raw or cooked. **Local name:** ahuama (von Reis, 1982).
PARAGUAY. Guarani people use for fibers. **Local name:** Guarani: Y-vira (Brucher, 1989).
Local name: yvira, ivira (Smith and Downs, 1979).
BRAZIL, Santa Catarina. **Local name:** gravata de cerca (Smith and Downs, 1979).

Puya chilensis *Molina* Terrestrial.
CHILE. Leaves produce a very strong rot-resistant fiber. **Local name:** Chagual, puya, cardon, cardon negro (Smith and Downs, 1974). Soft substance of stem is used for cork and bungs and as a pain-killer. Flowers yield a remedy for hernia. Indians use spines of leaves for fishhooks. (Smith, 1966).

Puya compacta *L.B. Smith* Terrestrial.
ECUADOR, Azuay. Base of fleshy stem and base of leaves deprived of spines is given to pigs for food. (Smith, 1948).

Puya floccosa *(Linden) E. Morren* Saxicolous.
VENEZUELA. Leaves used as a purgative when boiled. **Local name:** arua-yek (Siri von Reis, 1973).

Puya hamata L.B. Smith Saxicolous.
ECUADOR, Azuay. Older plants seem resistant to usual paramo grass-fires. **Local name:** achupalla-cimarona (*W.H. Camp E-2082* at F, SEL). Tender base of leaves used for salad and made into flour. **Local name:** aruaronga (von Reis Altschul, 1973).

Puya pyramidata *Ruiz & Pavon Schultes f* Terrestrial.
PERU. Leaves are used to feed guinea pigs. **Local name:** achupalla chica (von Reis Altschul, 1973).

Puya raimondii *Harms* Saxicolous.
BOLIVIA. Trunks are used as firewood. Shown to contain flammable resins. (Ferrell, 1986). BOLIVIA, Tupiza and Comanche. Inflorescence is eaten. **Local name:** Aymara: yaquis pala (Wilke, 1973).

Puya sodiroana *Mez* Terrestrial.
ECUADOR, Azuay. Base of the plant, especially the expanded leaf-base is eaten and said to be "good for the kidneys". Also fed to cattle and pigs. **Local name:** achupalla (*W.H. Camp E-2202* at NY). Favorite food for bears. Stems are fed to pigs and "cuys" (guinea pigs). **Local name:** achupalia (*W.H. Camp E-5198* at NY).

Tillandsia aeranthos *(Loiseleur) L.B. Smith.* Epiphytic.
URUGUAY. Aerial parts are used as an antispasmodic and for eye infections. **Local name:** clavel del aire (Alonso, 1995).

Tillandsia complanata *Bentham* Epiphytic.
ECUADOR, Canar. Used as wrapping for "sipibil" and "huminta"- like dish made with corn cheese, lard and salt. **Local name:** huicundos (*E. Kohn 1528* at MO). ECUADOR, Pichinia. **Local name:** huicundos *(E. Carlos 2555* at MO). ECUADOR, Carchi. **Local name:** guicundo *(J. Boeke 2372* at NY, SEL). ECUADOR, Azuay. **Local name:** huicundos *(B. Ollgaard 932* at NY, SEL). Dried basal leaves are used to wrap up tamales de borlios (corn flour with sugar). **Local name:** huicunto (*J. Steyermark 53250* at F).

Tillandsia erubescens *Schlechtendal* Epiphytic and saxicolous.
MEXICO. Cooked to a soup in water, mixed with 50% alcohol as preservative, then taken one teaspoonful each morning for anaemia and kidney trouble. **Local name:** hierba de pajaro, lichen de enchino, mescalito (von Reis Altschul, 1973).
ECUADOR. Used to cure kidney troubles. (Bennett, 1995).

Tillandsia ionochroma *André* ex *Mez* Epiphytic and saxicolous.
PERU, Puno. Sheep and llamas eat leaves. Children make toy whistles out of rolled leaves. **Local name:** huicunto (Bennett, 1990).

Tillandsia mooreana *L. B. Smith* Epiphytic.
MEXICO. Tarahumara people consider it to be a companion plant to peyote. (Arslanian, 1986).

Tillandsia purpurea *Ruiz and Pavon* Terrestrial.
PERU. Depicted on pre-Incan Mochica pottery of northern PERU. "Has been suggested that these depictions are often in context which can be interpreted as having 'magic' connotations". (Arslanian, 1986).

Tillandsia recurvata *(Linnaeus) Linnaeus* Epiphytic.
CURACAO. Leaf decoction is often taken as an emmenagogue, a remedy for

leukorrhea and for gallbladder complaints. (Morton 1981).
URUGUAY. Aerial parts are used as an antispasmodic and for eye infections. Local name: clavel del aire (Alonso, 1995).
ECUADOR. Treatments of gallbladder afflictions, menstrual irregularities, coughs, fever, headache, and chest pain. Also provides edible shoot apices. (Bennett, 1990).
PERU, Puno. **Local name:** Quechua: qaqa sunkha (Bennett, 1990).
ARGENTINA. Leaves, finely mashed and blended with butter, quickly cure hemorrhoids if applied twice daily. (Morton, 1981).
MIDDLE AMERICA. **Local name:** agave de palo, ball moss, barba di kadoesji, curujey, gallitos, heno, maru di palu, nidos de gungulen, old man's beard, pachtle, paixtli, three-leafed wild pine, tillandsia encorvada, tina (Morton, 1981).

Tillandsia rubella *Baker* Terrestrial.
BOLIVIA. Edible. **Local name:** horka (Smith and Downs, 1977).

Tillandsia sphaerocephala *Baker* Saxicolous.
PERU, Puno. Quechua use to adorn funeral ceremonies. **Local name:** ayahuicunto (death huicuntu) (Bennett, 1990).

Tillandsia stricta *Solander* Epiphytic and saxicolous.
BRAZIL. Used to make diuretic medicine which also has an antiblennorrhagic effect. (Leme, 1994).

Tillandsia usneoides *(Linnaeus) Linnaeus* Epiphytic.
GUATEMALA. Making arcos or slender arches erected over streets on holidays. Streamers are made with yellow fruit of Solanum mammosum. Worn in men's hats upon returning from a pilgrimage. This custom is believed to descend from an old Indian fertility rite.
MEXICO. Decoration of Aztec temples. **Local name:** paxte, Nahuatli or Aztec name: pachtli (Standley and Steyermark, 1958).
URUGUAY. Aerial parts are used as an antispasmodic and for eye infections. **Local name:** barba de viejo (Alonso, 1995).
MEXICO and UNITED STATES, Florida. Used as cushioning in furniture manufacturing by allowing outer covering to rot off and then cleaning, sorting and baling inner strand. **Local name:** Spanish moss (Jenson, 1982).
UNITED STATES. Used by American Indians and soldiers in the American Civil War as bandaging material. Bromelain, a proteolytic enzyme is thought to break down dead tissue and fibrin to enhance the rate of healing. Has been found significant analgesic effects in extracts. UNITED STATES, Louisiana. Used in tea as a folk remedy for diabetes and experimentally has been found to reduce blood glucose in rats 4 to 8 hours after ingestion. (Nellis, 1994). Houma Native Americans used as febrifuge. Dried fibers twisted and used for cordage and floor mats. Used for tanning in hide preparation and removing scum in cooking. (Moerman, 1986).
SUB-TROPICAL AND TROPICAL SOUTH AMERICA. **Local name:** barba-espanhola,

barba-de-macaco, barbo-de-pai-ventura, barba-de-pau, cabelos-do-rei, camambaia, crina-vegetal, erva-dos-bardonos, samambaia, samambaia-de-norte, hirahuasso (Sigrist, 1997).

Tillandsia violacea *Baker* Epiphytic and saxicolous.
MEXICO, Chiapas. Serves as an important ceremonial ornament. Arranged to hang along sides of doorways of religious officials' houses and alongside saints' enclosures within their houses. **Local name:** pac' ?ec' "corn tamale bromeliad" (Berlin, 1974).

Tillandsia xiphioides *Ker-Gawler* Epiphytic and saxicolous.
BOLIVIA, URUGUAY and northern ARGENTINA. Chest pain. (Beckstrom-Sternberg, 1994).

Vriesea friburgensis *Mez* Epiphytic and saxicolous.
BRAZIL, Sao Paulo, Parana, Santa Catarina, Rio Grande do Sul. Red and yellow dyes are extracted from leaves exposed to sun. **Local name:** gravata, monjola, bromelia (Reitz, 1983).

Vriesea tequendamae *(André) L.B. Smith* Terrestrial.
ECUADOR, Loja. Saraguro-Indian use as medicine for the nerves. **Local name:** chico colorado vicondo (*L. Elleman 91654* at AAU, SEL).

TABLE 1. BROMELIADS WITH LOCAL NAMES BUT NO REPORTED USES

Species	Common names	Location collected
Aechmea chantinii (Carr.) Bak.	Achuar Jivaro: wasake Mayne Jivaro: kuish Quechua: kil	ECUADOR, Pastaza
	piña piña	PERU Peru, Between Zungarocha and Puerto Almendra
Aechmea contracta (Mart. ex Schult f) Baker	Kubee: Cobuia	COLOMBIA, Vaupes
Aechmea mertensii (Meyer) Schult f.	Achual Jivaro: kuwish	PERU, Prov. Loreto, Puranchim, Rio Sinchiyacu
	Mayna Jivaro: kuish	PERU, Prov. Loreto, Loreto, Pampa Hermosa
	Achual Jivaro: kuwish	PERU, Prov. Loreto, Alto Amazonas, Washintsa, Rio Huasaga
Aechmea nidulariodes (L.B. Smith)	sacha piña	PERU, Prov. Loreto, Maynas
Aechmea tessmannii (Harms)	piña	ECUADOR, Prov. Pastaze, Pastaza Canton
	Achual Jivaro: kuwish	PERU, Prov. Loreto, Puranchim, Rio Sinchiyacu
Guzmania lingulata (L.) Mez	kuish	PERU, Valle del Rio Santiago
	sacha piña	PERU, Prov. Loreto, Maynas
Guzmania lingulata var. *lingulata* (L.) Mez	Achual Jivaro: kuwish	PERU, Alto Amazonas, Washintsa
	pita	ECUADOR, Prov. Pastaza, Pataza,
Guzmania monostachia (L.) Rusby ex. Mez	lechuga	ECUADOR, Prov. Manabi, Jipijapa PERU, Prov. Loreto, Pampa

Species	Common names	Location collected
Guzmania strobilantha (Ruiz & Pavon) Mez	Mayno Jivaro: kuwish	Hermosa PERU, Prov. Loreto, Maynas
Guzmania vittata (Mart. ex Schultes f.) Mez	sacha piña	MEXICO, El Desemboque
Hechtia montana (Brandegee)	Seri Indian: haamxoii (trimmed agave)	PERU, Dept. Cuzco, Prov. Urubamba, Chincheros
Puya ferruginea (Ruiz & Pavon) L.B. Smith	achupayalla	ECUADOR, San Jose, slopes of Mt. Chimborazo
	passas	PERU
	achupalla orcco-achupalla ccoe-achupalla china-achupalla	COLOMBIA, Prov. Bolivar, Mcipio, San Martin de Loba
Tillandsia balbisiana (Schultes f.)	cantagallito	PERU, Dept.de Puno, Prov. de Sandio, Cuyo-Cuyo
Tillandsia biflora (Ruiz & Pavon)	Quechua: huicunto	PERU, Dept.de Puno, Prov. de Sandio, Puno
Tillandsia capillaris (Ruiz & Pavon)	Quechua: qaqa sunka (rock beard)	BRAZIL
Tillandsia lorentziana (Grisebach)	sapucaia	PERU, Cuzco
Tillandsia oroyensis (Mez)	wayq'ontoy	Dominican Republic
Tillandsia paucifolia (Baker)	guajaca	PERU, Dept.de Puno, Prov. de Sandio, Cuyo-Cuyo
Tillandsia tenuifolia L.	Quechua: qaqa (rock) huicunto	

ACKNOWLEDGEMENTS

We would like to thank Harry E. Luther and Edna Sieff at the Bromeliad Identification Center for their taxonomic assistance and manuscript support. We would also like to thank Raul Rivero, Donna Atwood, Pep Smith and Larry Mitchell for their technical support.

LITERATURE CITED

Alonso, P.E. et. al. 1995. Screening of Uruguayan medicinal plants for antimicrobial activity. J. of Ethnopharm. 45:67-70.

André, E.F. 1983. Bromeliaceae Andreanae. Big Bridge Press: Berkeley.

Argivo, R. & M. Balick. 1993. Rainforest Remedies: One Hundred Healing Herbs of BELIZE. Lotus Press. Twin Lakes: 188-9.

Arslanian, R.L. & F.R. Stermitz. 1983. 3-Methoxy-5-Hydroxyflavonols from *Tillandsia purpurea.* J. of Nat. Prod. 49(6):1177-8.

Beckstrom-Sternberg, S.M., J.A. Duke & K.K. Wain. "The Ethnobotany Database." http://probe.nalusda.gov:8300/cgi-bin/browse/ethnobotdb. (ACEDB version 4.1 ñ data version July 1994).

Bennett, B.C. 1995. Ethnobotany and Economic Botany of Epiphytes, Lianas, and Other Host-Dependant Plants: An Overview. in Lowman, M.D. & N.K. Nadkarni, eds. 1995. Forest Canopies. Academic Press. San Diego: 558-559.

———. 1990. Ethnobotany of Bromeliads: Indigenous Uses of Tillandsias in Southern Andes of PERU. J. Bromeliad Soc. 40(2): 64-9.

Boza, F.V. & G.V. De Velez. 1990. Plantas alimenticias de Venezuela. Fundacion Bigott. Venezuela.

Brucher, H. 1989. Useful Plants of Neotropical Origin. Springer-Verlag. Berlin : 230, 251.

Coe & Anderson. 1996. Garifuna Ethnobotany. Econ. Bot. 50:106.

Duke, J.A. 1970. Ethnobotanical Observations on the Choco Indians. Econ. Bot. 24(3): 344.

Foster, M.B. 1950. Bromelia balansae, Armed with Daggers. National Geographic. XCVIII(4).

———. 1952 Bromeliad Soc. Bull. 2(3):34.

Feller, S.R. & M.B. Moser. 1985. People of Desert and Sea: Ethnobotany of the Seri Indians. Univ. of Arizona Press. Tuscon: 235.

Ferrell, J.E. 1986. UC's botanical overachiever is glorious but may be stressed. San Francisco Examiner. 12 September, 1986.

Gallegos, R.A. 1988. Etnobotanica de Las Quichuas de la Amazonia Ecuatoriana. Museos del Banco Central del Ecuador: Guayaquil. 9.

Hazlett, D.L. 1986. Ethnobotanical Observations from Cabecar and Guaymi Settlements in Central America. Econ. Bot. 40(3): 346.

Howard, R.A. 1994. West Indian Pharmaceuticals. Harvard Papers in Botany. 5:75.

Jenson, A.S. 1982. Spanish Moss: Symbol of the Southland. The Palmetto. 2(4).

Kopp, G., H. Williams & S. Coppersmith. "A Tropical Feast" http://www.mobot.org/MOBOT/education/feast/fruits.html. (Missouri Botanical Garden, 1989, revised 1992).

Leal, F. & L. Amaya. 1991. The Curagua (Ananas lucidus, Bromeliaceae) Crop in Venezuela. Economic Botany. 45(2):216-224.

Leme, E.M & L.L. Marigo. 1994. Bromeliads in the Brazilian Wilderness. Marigo Comunicaccao. Rio De Janeiro: 162.

Martin, F.W., C.W. Cambell & R.W. Ruberte. 1987. Perennial Edible Fruits of the Tropics: An Inventory. United States Dept. of Agriculture: 84.

Mayo, S. 1992. Neoglaziovia Variegata. The Kew Magazine: 9(3):124-127.

Mee, M. 1992. Bromelias Brasileiras. Instituto de Botanica de São Paulo. São Paulo: 48.

Moerman, D.E. American Indian Ethnobotany Database. "http://umd.umich.edu/cgi-bin/herb/" (Revised in 1986).

Morton, J.F. 1977. Major Medicinal Plants. C. C. Thomas Pub. Springfield: 43.

———1981. Atlas of Medicinal Plants of Middle America: Bahamas to Yucatan. C. C. Thomas Pub. Springfield: 63-67.

Natalucci, C.L., A. Brullo, M.I. Lopez, R.M.Hilal & N.O. Caffini. 1996. Macrodontin, a new protease isolated from fruits of *Pseudananas macrodontes* (Morr.) Harms (BROMELIACEAE). J. of Food Biochemistry. 19: 443-454.

Nellis, D.W. 1994. Seashore Plants of South Florida and the Caribbean. Pineapple Press Inc. Sarasota: 35-39.

Oliva-Esteva, F. & J.A. Steyermark. 1987. Bromeliads of VENEZUELA. Graficas Armitano C.A. Caracas.

Reitz, R. 1983. Flora Illustrada Catarinense Bromeliáceas e a malária-Bromélia endÙmica. Itajaì, Santa Catarina, Brasil.

Schultes, R. & R.F. Raffauf. 1990. The Healing Forest: Medicinal and Toxic Plants of the Northwest Amazonia. Dioscorides Press. Portland: 115-116.

Schultes, R. 1941. Plantae Mexicanae IX. Bot. Mus.Leafl. 9(7): 117-122.

Sigrist, S.R. Centro de Informatica na Agricultura. "http://www.ciagri.usp.br/plammedi/pm0104.html" (Updated April 8. 1997).

Smith, L.B. 1948. Lloydia. 11:305-6.

——— & R.J. Downs. 1974. Pitcairnioideae. Flora Neotropica. Monograph no. 14, pt. 1. New York: Hafner Press.

——— & ——— 1977. Tillandsioideae. Flora Neotropica. Monograph no. 14, pt. 2. New York: Hafner Press.

——— & ——— 1979. Bromelioideae. Flora Neotropica. Monograph no. 14, pt. 3. New York: New York Botanical Gardens.

Smith, T.M. 1966. Notes from Fellows: *Puya chilensis* at Tresco. J. of the Royal Hort. Soc. XCI(12).

Standley, N. 1938. Flora of Costa Rica. Field Museum of Natural History- Botany, Vol. XVIII.

Standley, P.C. & Steyermark. 1958. Flora of Guatemala, Vol. 3. Chicago Field Museum of Natural History.

van den Berg, M.E. 1984. Ver-o-Peso: The Ethnobotany of an Amazonian Market. Advances in Economic Botany 1:140-149.

Villagram, C., J. Meza, E. Silva and N. Vera. 1984. Nombres flolcloricos y usos de la flora de la ista Quinchao, chiboe. Publicacion ocasional del museonacional de historia natural. Santiiago, Chile. 27-28.

von Reis Altschul, S. 1973. Drugs and Foods from Little Known Plants: Notes in the Harvard University Herbaria. Harvard Univ. Press. Cambridge.

von Reis, S. & F.J. Lipp. 1982. New Plant Sources for Drugs and Food from the New York Botanical Garden Herbarium. Harvard University Press. Cambridge.

Waterman, P.G. 1969. Epiphytes of Economic and Medicinal Importance. Epiphytes. 72-74.

Wilke, K.L. 1973. Mi Reencuentro con la Puya raimondii. Haenkeana. 1:14.

Wilson, R. & C. Wilson. 1963. Bromeliads in Cultivation. Vol. 1. Hurricane House Pub., Inc. Coconut Grove.

Tillandsia guatemalensis in Ritual Adornment

[continued from page 73]

ACKNOWLEDGEMENT

We wish to thank Manuel Hernández Gómez, cuch nichim of San Juan Chamula, for his invitation to attend the ceremony described in this article and his willingness to help us understand the ways of his people.

LITERATURE CITED

Benzing, D. H. 1980. *The Biology of the Bromeliads.* Eureka, California: Mad River Press, p. 138.

Breedlove, D. E. and R. M. Laughlin. 1993. *The Flowering of Man: A Tzotzil Botany of Zinacantán.* Washington D.C.: Smithsonian Contribution to Anthropology No. 35, Volume 1, p. 275.

Hurley Vda. de Delgaty, A. and A. Ruiz Sánchez. 1986. *Diccionario tzotzil de San Andrés con variaciones dialectales.* México, D.F.: Institute Linguistico de Verano, pp.28, 52, 81, 91, 204.

Isley, P. T. 1987. *Tillandsia: The World's Most Unusual Air Plants.* Gardena, CA: Botanical Press, pp. 176, 201.

Luther, H.E. and E. Sieff. 1994. An Alphabetical List of Bromeliad Binomials. Newberg, Oregon: The Bromeliad Society, p.50.

Smith, L.B. and R.J. Downs. 1977. *Tillandsioideae (Bromeliaceae).* In Flora Neotropica Monograph no.14(2):721. New York: Hafner Press.

Utley, J.F. 1994 Bromeliaceae. In Flora Mesoamericana Volumen 6. México,D.F.: Universidad Nacional Autónoma de México, p. lll.

Santa Barbara, California

Welcome New Members

We are very pleased to welcome the following people who have joined the BSI November 1997 through January 1998.

Thomas Beckman
Jim Boatman
John Bohrman
Patsy Breunlin
John Brooks
Walter Brust
Alejandro Cardenas
George Cassa
G. Christie
Victor De Carvalho
Pat Davis
Laurie Dean
Paul DeRoose
Joseph De Rosa
Billy Devincentis
James Diavatis
Ruben Diaz
Anthony Diguglielmo
Robert Dixon
Merce Dostale
Gerd Ehlinger
Johanna Elder
Dick Endt
Cathy Erickson
Robin Ernst-Phillips
Philip Faulisi
Joe Freeman
Jan Freund
Mike Gaborek
Patricia Gauss
Grandview Garden Club
Keith Granquist
Tom Greek
Julie Greenhill
Carl Griffen
Glenys Guild
Bruce Hague
Elmer Hahn
Adelaide Helbig
Ron Hibbard
Bernice Hill
Lisa Hoffman
Susan Jackson
Alan Jellson
Mike Keating
Richard Knee
R. Knox
Carl Kortier
Diane Kowalski
Donald Kruger
Michael Lee
Randy Lewis
Gary Lund
Marcia Manthey
Billy Martin
Winnie McCarley
Pat McDowell
Brett Miller
Craig Murray
Sarah Nix
Evelyn Norn
Northwest Garden Club
Jim O'Shaugnessy
Sherry Partlow
Frank Pepi
Patricia Perratt
Martin Schmidt
Sally Schur
Donald Sherman
Robin Spurlino
John Stefanski
B. Taller
Junko Tanaka
Tauranga Brom. Study Group
Leslie Telford
Linda Toci
Darla Trenner
Beverly Vincent
Graham West
R. Wilkinson
Alan Woods
Susan Woodward
Takashi Uematsu
Vivian Welsh

Bromeliad Roundup

Allyn Pearlman

"The stars at night...are big and bright...Deep in the heart of Texas!"...And they are getting bigger and brighter because we are getting closer and closer to the "Bromeliad Roundup."

As the stars get bigger and brighter, so does the cost of registration. You had better take advantage of this advanced registration or the sheriff just might come and track you down and put you in jail. As a matter of fact, we have some bounty hunters looking for you NOW! Remember, after April Fools' Day your registration will increase.

The Greater Houston and Visitors Bureau has captured the slogan "Expect the unexpected" for our great city, Houston. "Bromeliad Roundup" will offer some unexpected auction items. Thanks to Dennis and Linda Cathcart, our friends at Tropiflora, for donating a beautiful bromeliad hand-carved mahogany chest from Honduras. Better be careful, Granny just might outbid you.

Figure 12. Dennis Cathcart

Greenspoint Mall nestles close to the Wyndham Greenspoint ranch with way over 150 stores to in which to spend your money. Save money for the plant sales. If you ain't playing horseshoes or dominos, you just might be hitting that little white ball on some of the prettiest golf courses.

The 13th World Bromeliad Conference will take place from July 1 through 5, 1998. Y'all come on over!

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

	Rates[1]	One Issue	Six Issues
ALL ADVERTISING PREPAID.	Full Pages	$125.00	$625.00[2]
	1/2 Page	70.00	350.00[2]
Advertisers to provide any art work desired.	1/4 Page	45.00	220.00[2]
	1/8 Page	25.00	125.00[2]

[1] Cost for color ad furnished on request. [2] Plus $25.00 per ad change.

Advertising is presented as a service to our membership and does not necessarily imply endorsement of the product. Please address all correspondence to: Editor—Chet Blackburn, 720 Millertown Road, Auburn, CA 95603.

BROMELIAD ROUNDUP

13th World Conference
Houston, Texas July 1-5, 1998

COME JOIN THE FUN!

ROUND UP YOUR FAVORITE BROMELIADS
ROUND UP YOUR FAVORITE ACTIVITIES

- Plants
- Accessories
- Seminars
- Home Garden Tours
- Auctions
- Raffles

- Moody Gardens – Galveston
- 3-D Imax Theatre – Galveston
- Cockrell Butterfly Center – Houston
- Natural Science Museum – Houston
- Imax Theatre – Houston
- NASA/Space Center Tours

ROUNDUP BANQUET AND MUCH, MUCH, MORE!

WYNDAM GREENSPOINT HOTEL
Make your reservations today!
For more information and registration contact:
Betty Garrison (281) 358-2641 FAX (281) 359-1446
e-mail: don_betty@nhmccd.campus.mci.net

The Bromeliad Society International

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

Anne Collings

×*Pitinia* 'Coral Horizon', a hybrid between *Pitcairnia rubronigriflora* and *Pepinia corallina*. Jim Irvin made the cross. The plant above was shown by Diana Molnar in the Caloosahatchee Bromeliad Society Show and was the recipient of the Mulford B. Foster award for "Best of Show." Additional information about the plant can be found in text beginning on page 64.

Calendar

11-15 Mar	The Venezuelan Bromeliad Committee will hold its annual show and sale at the PDVSA garden, located at Libertador Avenue, Caracas Venezuela. For information contact Esther Pardo by e-mail at rpardo@true.net or by Fax at 00-582-977-1431
28-29 Mar	The Bromeliad Society of South Florida will hold its annual standard show and sale at Fairchild Tropical Gardens, 10901 Old Cutler Road, Miami, FL. The show is free but there is an $8.00 admission to the botanical gardens. Admission will be waived on Sunday morning before noon. Contact Nancy Steinmetz at 305-235-1507, or Moyna Prince at 305-251-5289.
28-29 Mar	Tarrant County Bromeliad Society Annual Show; Fort Worth Botanic Garden Center.
18-19 Apr	Sarasota Bromeliad Society annual show and sale co-sponsored with the Marie Selby Botanical Gardens will be held at Selby Gardens, 811 South Palm Avenue, Sarasota, FL.
2-3 May	The La Ballona Valley Bromeliad Society and the Sunset Succulent Society annual show and sale in the Garden Room of the Veteran's Memorial Center, intersection of Overland and Culver Blvds, Culver City. Hours are 11 a.m. to 4:30 p.m. on Saturday, and 10 a.m. to 4 p.m. on Sunday. Contact: Charlyne Stewart, 310-391-4118.
16-17 May	The Greater New Orleans Bromeliad Society's 26th annual show will be held at the Lakeside Mall, Metairie, LA. Hours are 1:00 p.m. to 6:00 p.m. on Saturday, and 11:00 a.m. to 4:00 p.m. on Sunday. Contact: Carol Hertz 504-486-8190.
30-31 May	The Shreveport Bromeliad Society annual show and sale at the Barnwell Garden and Art Center, 501 Clyde Fant Pkwy., Shreveport, LA. Hours 1:00 p.m. to 5:00 p.m. on Saturday, noon to 5:00 p.m. on Sunday. Contact: Harvey C. Beltz. 318-635-4580.
1-5 July	"Bromeliad Roundup", the 13th World Bromeliad Conference will be held in Houston, Texas at the Wyndham Greenspoint Hotel. Contact Don & Betty Garrison, 1119 Lisa Lane, Kingwood, TX, USA, 77339-3429. Telephone 281-358-2641; Fax 281-359-1446, e-mail don_betty@nhmced.campus.mci.net.