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Cover photographs. Front: *Tillandsia portillae*, an attractive new species from Ecuador. Description by Elivira Gross begins on page 52. Photograph by Rudolf Wülfinghoff. Back: *Vriesea* X Towering Flame, a John Arden Hybrid. Photograph by Chet Blackburn.

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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 Cherry Creek Inn, Denver, Colorado at 8:30 a.m. on June 14, 1997 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, other 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. You are invited to take part in this very important function by nominating for any committee chairmanship anyone you have found to be qualified, capable, and willing to serve.

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*

A Brilliantly Colored New *Tillandsia* From Ecuador

Elvira Gross

Photography by Rudolf Wülfinghoff

Every year Rudolf Wülfinghoff, an enthusiastic hobbyist and botanist travels to Ecuador looking for interesting plants, especially bromeliads and orchids. He has discovered several new species in the last few years including a magnificent new *Tillandsia* in November, 1993.

Tillandsia portillae E. Gross & R. Wülfinghoff sp. nov. (cover photograph, figure 1)

Type. Ecuador. Prov. Loja: 2800 m elevation, Nov, 1993. *R. Wülfinghoff* 93/471 (holotype:HEID).

Affinis est *Tillandsia porphyrocraspedae* J.R. Grant (syn. *Vriesea cylindrica* L.B. Smith), sed postrema differt a *T. portillae* in characteribus sequentibus: Inflorescentia anguste-cylindrica. Spicae 8 usque ad 12 floriferae paucis bracteis sterilibus ad basim. Petala 3 cm longa, viridia marginibus obscure-purpureis. Etiam *T. tequendamae* André [syn. *Vriesea tequendamae* (André) L.B. Smith] affinis est *T. portillae*, sed differt ab ea in characteribus sequentibus: Planta major, usque ad 80 cm alta. Vaginae usque ad 17 cm longae. Inflorescentia pendula, anguste-cylindrica. Spicae 6 usque ad 10 floriferae. Petala 4 cm longa, viridia marginibus caerulea-violaceis.

Plant terrestrial and epiphytic, stemless, flowering up to 55 cm tall. **Leaves** erect, forming a large rosette 40 cm high and 40 cm in diameter (figure 1). **Leaf sheaths** conspicuous, long-ovate, 8 × 6 cm, dark brown lepidote on both sides, pale and glabrous at the base only. **Leaf blades** narrowly triangular, long acuminate, 25–30 cm long, 3–3.5 cm wide above the sheath, densely appressed lepidote on both sides, tinged reddish (influence of insolation), somewhat canaliculate. **Scape** erect, shorter than the leaves and hidden by the leaf sheaths, 15 cm long. **Scape bracts** erect, densely imbricate, longer than the internodes, orange-red, the upper with a big ovate sheath and a long filiform, recurved blade. **Inflorescence** erect, bipinnate, 35–40 cm long, 4 cm thick, with ca. 15 erect polystichously arranged spikes, which are covered by the primary bracts. (cover photo). **Primary bracts** subglobose with a little tip, 4–4.5 cm long and 4.5 cm wide, nerved, somewhat inflated, sparsely brown lepidote beneath, densely brown lepidote at the base and tip, glabrous above, red to yellow-orange. **Spikes** subsessile, with 3 flowers, 3 cm long (without petals), 2.5 cm wide, with an addorsed bracteole. **Flowers** subsessile, arranged in a fan shape, up to 6 cm long. **Axis of inflorescence** not visible, nerved, densely brown lepidote. **Floral bracts** ovate, more or less rounded and apiculate, as long as the sepals, those of the outer flowers carinate, nerved, sparsely brown lepidote, base and tip densely brown

lepidote, 2 cm long, 1.5 cm wide, coriaceous, with a hyalin margin. **Sepals** oblong-ovate, rounded, the posteriors subcarinate, free, coarse, with a hyalin margin, glabrous on both sides, slightly nerved, exceeded by the primary bracts. **Petals** linear, 5 cm long, 6 mm wide, grass-green, tips and margins black-violet (cover photo), two emarginate 1 cm long ligules (scales) at the base. **Stamens** exserted with black anthers and golden-yellow pollen grains. **Style** exserted. **Stigma** spirally twisted and papillous. **Ovary** triangular, 8 mm high.

The plant, which would be considered in the old tradition as one of the “grey-leaved vrieseas”, belongs to the genus *Tillandsia* subgenus *Tillandsia* according to the definition of J.R. Grant.¹ Characteristics of this group are the exserted stamens and style, narrow spatulate or ligulate petals, and linear to triangular, densely lepidote leaves.

Spectacular features of *T. portillae* are the densely brown lepidote tips of the primary bracts and floral bracts, and the striking color of the inflorescence with its orange bracts and green-violet flowers contrasting with the yellow pollen grains and black-violet petal tips.

The name *T. portillae* honors José Portilla, who has accompanied Mr. Wülfinghoff on several trips in Ecuador.

Heidelberg, Germany



Figure 1.
Tillandsia portillae

¹ Phytologia 75(2):170-175, 1993

Bromeliads Along the ACEER Canopy Walkway in Amazonian Peru

Donald Murray,¹ Margaret Lowman,² Philip Wittman³

Photography by Margaret Lowman

Peru has 17 genera and 420 species of bromeliads of which 239 are endemic (Brako and Zarucchi 1993). The list presented in this paper all occur along or near the aerial walkway at the Amazon Center for Environmental Education and Research (ACEER) in northern Peru. The ACEER is located on the Amazon Biosphere Reserve which encompasses two hundred and fifty thousand acres of primary rain forest within the upper Amazon Basin. The ACEER is approximately 4 hours by boat from Iquitos, down the Amazon River and up the Napo River to the Sucasari tributary. Iquitos is served by weekly direct flights from Miami, Florida and daily flights from Lima, Peru.

One of the outstanding features of the ACEER is its 1200 foot long canopy walkway that leads the visitor from ground level to a height of 118 feet. This multilevel system of aerial platforms and suspension bridges allows easy access for both scientists and eco-tourists to observe the rain forest canopy and its diverse community of epiphytes (figure 2).

ACEER AND THE CANOPY WALKWAY

The non-profit ACEER foundation was created in 1991 by International Expeditions, Inc. (Helena, Alabama, USA) in cooperation with Conservación de la Naturaleza Amazonica del Peru A.C. (CONAPAC) (Iquitos, Peru) with the full support of the Peruvian Ministry for the Environment. Since its opening, the ACEER has hosted many workshops for both educators and children, in addition to encouraging research by scientists from around the world. Eco-tourists who visit the ACEER reserve and its canopy walkway can observe biological research firsthand, as well as appreciate the architectural features of the forest canopy (figure 3).

The ACEER facility is located in northeastern Peru (latitude 3° 15' S, longitude 72° 54' W) within pristine lowland (70.1 meters/230 feet above sea level) tropical rain forest near the Sucasari tributary of the Napo River, which is itself a tributary of the Amazon River. The average temperature is 85-90° F, and it can rain up to 2 inches per day during wet periods.

BROMELIADS FOUND ALONG THE CANOPY WALKWAY

During 1994-6, we spent several months observing and identifying the epiphytes along the ACEER walkway (figure 4). This project represents part of the research mission of Selby Botanical Gardens, as well as serves to assist in the interpretation of the walkway for the ACEER foundation. The following species have been confirmed to date:

Aechmea beeriana L.B. Smith & M.A. Spencer (Synonym *Streptocalyx poeppigii* Beer).

A relatively uncommon bromeliad along the walkway. Flowering shoot 30-40 cm high, inflorescence-axis and bracts rose-pink. Leaves numerous and as long as 1-2 m in length. Prefers a semi-shade environment (individuals were marked at a height of 24 m on tree trunks, and observed to receive no more than 1 hour of full sun each day). Relatively rare at ACEER, but common in Colombia, Ecuador and Brazil at middle latitudes of 25-1200 m. Mainly epiphytic but sometimes terrestrial or saxicolous.

Aechmea chantinii (Carriere) Baker.

Common along the ACEER walkway, usually green with transverse white bands on both sides. Flowering stem erect and longer than the leaves. Inflorescence varies in color from deep purple to red-orange. Found mainly in the shade of the inner canopy, in clumps ranging from 2 to 16 individual rosettes. Distributed throughout Amazonian South America.

Aechmea chantinii forma *amazonica* (Ule) H. Luther.

Leaves plain green or reddish and concolorous. Distribution ranges from Colombia, Brazil, Ecuador and Peru.

Aechmea contracta (Martius ex Schultes f.) Baker.

Situated in the deep shade only 2 meters up a tree trunk at ACEER. Leaves number 5-10, subfasciculate, and up to 85 cm in length. Inflorescence simple or with 2-4 spikes, 7-25 cm long. Fairly uncommon to the ACEER area.

Aechmea hoppii (Harms) L.B. Smith.

Leaves 60-100 cm long. Inflorescence cylindrical, densely bipinnate, 12-30 cm long with up to 20-30 spikes. Primary bracts red and up to 1 cm in length. Found in the shade of the inner canopy 18-26 m high. Distribution includes Colombia, Ecuador and Peru.

Aechmea mertensii (G. Meyer) Schultes f.

One small clump found at a height of 25 m along ACEER walkway in the outermost canopy in full sun. Rosette-forming green leaves 20-40 cm long. Scape short and slender, red-orange in color. Wide distribution within South America.

¹ Research Intern, Marie Selby Botanical Gardens

² Director of Research and Conservation, Marie Selby Botanical Gardens

³ Research Associate, Marie Selby Botanical Gardens



Figure 2.

Aerial view of the extensive canopy walkway through lowland tropical rain forest at the ACEER site in Peru.

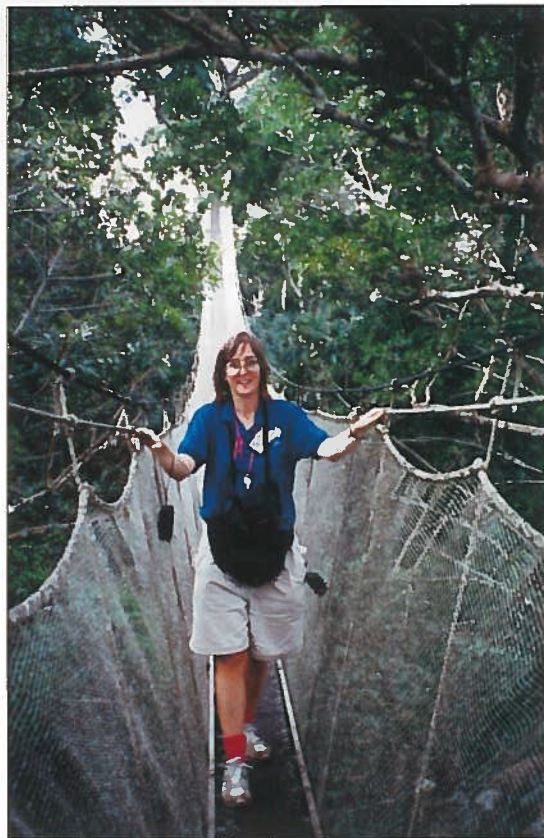


Figure 3.

Visitor on the ACEER canopy walkway in Peru.

Aechmea nallyii L.B. Smith.

Very common along ACEER walkway, mainly located within lower and inner canopy but sometimes in the outer canopy. As many as 60 individuals of *Aechmea nallyii* can be counted on one tree, from heights of 16–36 m. Approximately 10 leaves in a funnel-form rosette, 45 cm long. Scape straight, slender and distinctly exceeds the leaves. Endemic to Amazonian Peru. (See Lowman *et al.* 1996).

Aechmea nidularioides L.B. Smith.

Uncommon bromeliad along the walkway but distributed from southern Colombia to northern Peru. Leaves pale green to rusty-red and up to 1 m long. Inflorescence bipinnate up to 15 cm long. Flower head elongated globe shape. Has been observed with a poison dart frog within its tank.

Billbergia cf. *decora* Poeppig & Endlicher.

Found fairly close to the walkway, and visible with its large carmine pink-red inflorescence bracts. Leaves narrow-elliptical and about 10 to 20 cm long. Common to Amazonian Peru, Bolivia, Brazil and Ecuador.

Guzmania calothyrsus Mez.

Found near to the walkway, growing in a shady region. Leaves 40–50 cm long and 3–4 cm wide, long-tapered and green. Inflorescence simple, cylindrical, with flowers situated all the way to the tip. Distributed throughout Peru, Bolivia, Brazil and Colombia.

Guzmania vittata (Martius ex Schult. f.) Mez.

Decorative foliage, stemless, green leaves 35–55 cm long with broad dark latitudinal bands. Inflorescence comprised of a tall green spike ending in a small round head of greenish bracts, edged with dark purple, and white flowers. Fairly uncommon to the ACEER area, with one individual observed on a tree trunk at 16 meters in semi-shade.

Neoregelia eleutheropetala (Ule) L.B. Smith.

Fairly common along the walkway, usually in full sun. A stoloniferous plant with leaves 50–70 cm long, mainly green in color with white or pale violet on the innermost leaf bases. Inflorescence 6–8 cm in diameter, composed of many white flowers surrounded by short mucronate outer bracts. Distributed in northern Peru through Colombia to Brazil.

Neoregelia cf. *rosea* L.B. Smith.

Several clumps visible along the walkway in full sun. Leaves rosulate, 50–60 cm long. Inflorescence approximately 5 cm in diameter and sunk in the center of the rosette, compound and many-flowered. Known from Peru only.

Neoregelia mooreana L.B. Smith.

Small bromeliad found commonly along the walkway. Leaves form a dense rosette, 30 cm long. Inflorescence sunk in the center of the rosette, simple with few-flowered floral bracts (about 3 cm long). Found 20 m up on a branch overhanging the walkway. Known from Peru and Ecuador.

Neoregelia myrmecophila (Ule) L.B. Smith.

Uncommon to the ACEER walkway. Leaves up to 70 cm long in a rosette, green or reddish. Scape short, up to 1 cm in diameter. Inflorescence compound and digitate, 3–6 cm in diameter. Ants appear to like this bromeliad. Distributed in Ecuador, Brazil and Peru.

Neoregelia cf. margaretae L.B. Smith.

Stemless plant found on a tree trunk close to walkway, 23 m high, in semi-shade. Leaves green to red and over 30 cm long, comprising a dense rosette. Inflorescence sunk in the center of the leafy rosette, with small white petals about 1 cm long. Distribution Brazil and Peru.

Werauhia gigantea (Martius ex. Schultes f.) J.R. Grant. (Synonym: *Vriesea amazonica* Baker) Mez in Martius.

Found near walkway on a tree trunk at 1 m height. Leaves 50 to 80 cm long, pale green on both sides, deltoid at apex. Spike over 30 cm long. Fairly uncommon to ACEER. Distributed in Venezuela, Trinidad, French Guyana, Amazonian Brazil and Peru.



Figure 4.
Technical climbing to examine epiphytes
near ACEER, Peru

AN EPIPHYTE DIVERSITY AND ABUNDANCE STUDY

A study of the abundance and diversity of epiphytes within a Peruvian forest canopy is currently in progress by one of us (DM), while measurements of their herbivory are also being recorded (ML). These studies represent the first epiphyte community studies within the upper Peruvian Amazon and the first to be carried out from the ACEER canopy walkway system. Many of the above bromeliads were found within a 50 by 50 meter plot along one of the walkway spans. Results of these field projects will be reported in upcoming publications.

We highly recommend the thrilling experience of visiting the ACEER walkway, for both the bromeliad enthusiast as well as anyone who appreciates the wonders of the rain forest canopy. Anyone interested in staying with the ACEER facility in Peru should contact: The ACEER Foundation, 10 Environs Park, Helena, Alabama, USA, 35080. Telephone 1 (800) 255-8206.

ACKNOWLEDGMENTS

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We thank the ACEER and CONAPAC for providing canopy access in Peru. Many thanks also to Harry Luther for plant determinations, and Ellen Baskerville for technical assistance.

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Marie Selby Botanical Gardens
Sarasota, Florida

Protection of Florida's Native Bromeliads by Control of *Metamasius callizona*

J.H. Frank¹

Florida's rarest native bromeliads *Catopsis berteroniana*, *C. floribunda*, *C. nutans*, *Guzmania monostachia*, *Tillandsia pruinosa*, and *T. flexuosa* (Ward 1979) are in imminent danger as populations of a non-indigenous weevil encroach on the Everglades area. Florida populations of *Tillandsia utriculata*, once common and widespread, have been so devastated that this species and *T. fasciculata* have been placed on the list of endangered species (Florida Administrative Code 1996). The only realistic way of controlling the weevil populations is by biological control (Van Driesche and Bellows 1996), and funding for the research program into biological control will be overdrawn by January 1, 1997.

This weevil, *Metamasius callizona*, is native to southern Mexico and Central America (Frank & Thomas 1994a,b), was detected in a nursery in Broward County, Florida in 1989, and became feral in that county (O'Brien and Thomas 1990, O'Brien *et al.* 1990). By natural dispersal and by human transport of infested plants it had spread by September 1996 to at least ten Florida counties: Broward, Charlotte, Collier, Dade, Glades, Lee, Manatee, Palm Beach, St. Lucie, and Sarasota (McKenzie 1990, Frank and Thomas 1991a,b and unpublished). Not only does it infest state and county parks, but also private lands including woodlands and private bromeliad collections as well as the Marie Selby Botanical Gardens.

Damage is caused mainly by the weevil larvae which mine the meristematic tissue of these plants to kill them and decimate populations. Although the weevil may be a specialist of the larger *Tillandsia* species (which provide enough plant tissue for the development of its larvae), it also attacks *Catopsis* and *Guzmania* (Frank and Thomas 1994b and unpublished). A potential biological control agent (a specialist parasitoid fly) has been discovered in Central America by Dr. Ronald Cave (a collaborator at Escuela Agricola Panamericana [EAP], a U.S. institution in Honduras)

Local bromeliad societies in Florida have held plant sales and forwarded enough funds through the Florida Council of Bromeliad Societies (FCBS) to support a very modest research program at the University of Florida. FCBS has also budgeted funds to support 18 months of work by a student at EAP on culture methods, behavior, and host range for the fly.

The University of Florida allows the program partial use of a laboratory and greenhouse, as well as a small percentage of my time. However, it supplies no

funds to pay for survey travel within Florida nor for the pay of a student who works 20 hours/week maintaining cultures in greenhouse and laboratory. Requests for funding for these purposes to government agencies, conservation organizations, and the Florida Nurserymen's and Growers' Association, have fallen on deaf ears. Continuing work in Florida on location of weevil populations, and culture of its immature stages as laboratory hosts for rearing and testing of biological control agents, has now been funded by FCBS until January 1, 1997 but must cease very soon thereafter unless funds are supplied, thus destroying the research program.

The objective of the program is to determine the feasibility of establishing a population of the parasitoid fly *Admontia sp.* in south Florida to protect Florida's native bromeliads, to evaluate the effects of the fly, and, should the project prove to be feasible, rear the flies in sufficient quantity for establishment in infected areas. A four year plan to accomplish this objective is as follows:

In federal FY 1996/1997 (beginning October 1, 1996) the project expects to do the following:

1. At EAP - elucidate the life history of the parasitoid fly and devise culture methods for it;
2. In Gainesville, Florida - maintain and augment a culture of the weevil *Metamasius callizona* in a greenhouse to serve as hosts for the fly when it is brought to Florida;
3. In south Florida - continue surveys for presence and population size of *M. callizona* and document bromeliad species attacked;
4. In Ontario, Canada - prepare a description of the fly (Diptera: Tachinidae: *Admontia* new species) for publication.

In federal FY 1997/1998 the project expects to:

1. At EAP - test the host range of *Admontia sp.* using non-target species available there as well as *M. callizona* imported from Florida; prepare a thesis, and prepare manuscripts for publication;
2. In Gainesville - maintain and augment a culture of the weevil *Metamasius callizona* in a greenhouse to serve as hosts for the fly when it is brought to Florida; bring material of *Admontia sp.* to quarantine and further test its host range using non-target species available in Florida; if *Admontia sp.* has a narrow host range (i.e., will not attack or not successfully attack any insect hosts other than bromeliad-killing *Metamasius* weevils), then apply for a federal permit for its release in Florida and begin to culture it in large numbers for release in south Florida;
3. In south Florida - continue surveys for presence and population size of *M. callizona* and select release sites.

¹ Entomology & Nematology Dept., University of Florida, Gainesville, FL

In federal FY 1998/1999 the plan is to:

1. In Gainesville - maximize production of *Admontia* for release in south Florida;
2. In south Florida - make releases of *Admontia* sp. in the areas selected; later, collect *M. callizona* larvae in south Florida, bring them to Gainesville, and evaluate the proportion parasitized by *Admontia*.

In federal FY 1999/2000 the project expects to:

1. In Gainesville - maintain a stock of *Admontia* sp.;
2. In south Florida - continue to collect *M. callizona* larvae from increasingly wider areas to evaluate the proportion parasitized by *Admontia* sp.;
3. In Gainesville - write an account of the project for publication in a scientific journal.

This four year plan is experimental and, as with all experiments in biological control, there can be no guarantee that it will work at all, never mind within the budgetary periods specified. If it works, then its expected benefit is to make *M. callizona* as rare as it was found to be in Mexico and thus protect Florida's native bromeliads. If it does not work as predicted, the intermediate results are likely to indicate what the problems are, so that plans can be modified.

TABLE 3: COST SCHEDULE: FUNDS NEEDED

	FY 1996/97	FY 1997/98	FY 1998/99	FY 1999/2000
Honduras	FCBS*	FCBS*	N/A	N/A
N. Florida	5,000**	6,300	10,000	6,300
S. Florida	1,000	1,000	2,000	3,000
Canada	NC	none	none	none
Total	6,000	7,300	12,000	9,300

* FCBS has already committed the total cost (\$6,900).

** The figure given is low because part (\$1,300) has already been supplied by FCBS.

Note: \$1,300 in funds to be supplied by the BSI are not yet indicated as supplied or committed.

This project began in 1991, supported by funds supplied by local bromeliad societies in Florida (as coordinated by FCBS) which, by the end of FY 1994/1995 totaled cumulatively about \$15,000. At the same time, the Bromeliad Society International contributed \$3,000.

The University of Florida contributed the use of a greenhouse and laboratory, with utilities, and approximately four months of my time, and paid my publication costs.

The Division of Plant Industry, Florida Department of Agriculture and Consumer Services (DPI), contributed about 5 weeks of the time of Dr. Michael Thomas, taxonomic entomologist, and occasional use by him of a vehicle for surveys in south Florida, as well as per diem for him during these surveys. I was permitted to accompany Dr. Thomas in DPI vehicles, but paid my own costs for food and lodging.

I attended an average of three bromeliad society meetings annually in various Florida cities to inform their members at my expense. While on sabbatical leave in southern Mexico for 6 months in 1995, I contributed many weekends of my time and at my expense, for surveys for *M. callizona* and any other bromeliad-killing weevils that might occur.

In FY 1995/1996, the Florida bromeliad societies contributed an additional \$8,300, of which \$6,000 were to pay for the part-time student worker at the University of Florida, and \$2,000 for use by Dr. Ronald Cave at EAP - the discoverer of the potential biological control agent (*Admontia* sp. a parasitoid fly). The University of Florida contributed (as previously) use of a greenhouse and laboratory, and about 4 weeks of my time. DPI contributed 3 days of the time of Dr. Thomas and use of a vehicle for a survey in March 1996 (I accompanied him). In July, 1996, I paid for the costs of a three-day survey in south Florida.

For FY 1996/1997 the Florida Council of Bromeliad Societies has budgeted \$4,600 for use by a student of Dr. Cave and has also contributed \$1,300 for costs in north Florida. The Bromeliad Society International has allocated an additional \$1,300 to the project and the University of Florida and DPI doubtless will continue to contribute as before. There is still a shortfall of funds for FY 1996/1997 with \$6,000 more needed by current projections.

For FY 1997/1998 the Florida Council of Bromeliad Societies has budgeted \$2,300 for use by a student of Dr. Cave; it cannot commit additional funding which it does not have. The University of Florida and DPI probably will contribute as before. At current projections that would leave a shortage of \$7,300 in funds.

For FY 1998/99 no funds are committed, and \$12,000 are needed under current projections.

For FY 1999/2000 no funds are committed and \$9,300 will be needed.

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Gainesville, Florida

Speaking of Bargains

How much would you be willing to pay for a book containing approximately 250 pages of both scientific and non-technical text, including the latest information on bromeliad classification, cultivation, conservation, and personal experiences in collecting, showing and growing them? What if that book also had about 100 drawings and photos, including 72 color photographs? And what if about half of the plants depicted in those photographs had never been depicted on film in a publication before? Indeed, what if 16 of those were plants being described for the very first time?

Would you buy that book if it sold for only \$25.00 to \$30.00? If you are reading this, you have already done so, because that was the content of the six issues of Volume 46 of the JOURNAL OF THE BROMELIAD SOCIETY last year. If you don't think that is a bargain, try pricing books of comparable size and quality in a book store these days.

Some Notes on the Remarkable Bromeliad Genus *Glomeropitcairnia*

Walter Till, Heidemarie Halbritter, and Gunter Gortan¹

Photography by the Authors

Grisebach (1864) described the earliest member of this genus as *Tillandsia penduliflora*, Baker (1889) transferred it to *Caraguata*, and Wittmack (1890) followed him. Mez (1896) placed it in its own subgenus of *Pitcairnia* which he named *Glomeropitcairnia*. Not until 1905, when Mez described the second species, did he recognize *Glomeropitcairnia* as a distinct genus within subfamily Tillandsioideae. These few examples demonstrate how much the leading Bromeliad experts of those days had been puzzled by the half-inferior ovary, the imperfectly dehiscent capsule, and the pappiformously biappendaged seeds, all being features characterizing this genus.

Glomeropitcairnia penduliflora (Grisebach) Mez is distributed on the Lesser Antillean islands of Montserrat, Guadeloupe, Dominica, and Martinique, while *G. erectiflora* Mez is restricted to the Paria peninsula in northeastern Venezuela and adjacent Isla Margarita and Trinidad. The most recent taxonomic treatment is that of Smith and Downs (1977). Foster (1956) first published a photograph of the tank rosette of *G. penduliflora*, Hodge (1962) illustrated a flowering specimen of this giant species. Field impressions accompanied by color photographs as well as a brief phylogenetic discussion have been published by Gilmartin and Brown (1986).

Both species grow in montane forests where temperatures are quite moderate, precipitation is high and fog is frequent (Foster 1956, Hodge 1962, Gilmartin & Brown 1986, Hase 1996). In Dominica W. Till has found *G. penduliflora* as a frequent epiphyte on the western slopes of Morne Trois Pitons and less frequent as a terrestrial in disturbed areas. At this locality the plants were in their final stage of flowering in mid February 1996. The species was further seen quite frequently on the southeastern slopes of Morne Macaque (= Micotrin) and on a mountain ridge south of Morne Diablotins northeast of Salisbury. The mentioned sites are located between (350-) 500-800 m s.m. At least in Dominica *G. penduliflora* seems not to be threatened by collecting if not by habitat destruction. F. J. Hase has found *G. erectiflora* on the Serbatana ridge above Carupano (figure 5) at an elevation of 1100 m s.m. in a very foggy and humid environment. *G. erectiflora* is obviously restricted to very local populations and seems to be threatened by forest clearing and burning.

The large branched inflorescence of *G. penduliflora* is inconspicuously yellowish green, the floral bracts are green, the sepals are of similar color, and

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Figure 5.
G. erectiflora in its natural
environment at the Serbatana
ridge.



Figure 6.
Spike of *G. penduliflora*. Note the pastel orange petals.



Figure 7.
Inflorescence of *G. erectiflora*



Figure 8.
Spike of *G. erectiflora*. Note the orange petals.

the petals are pastel orange (figure 6). In contrast, the slenderly cylindric inflorescence of *G. erectiflora* as well as the floral bracts are bright carmine red (figure 7), the sepals are greenish orange, and the petals are orange (figure 8).

Thanks to recently collected fresh material it is possible to present morphological data of stigmas and pollen of both species (plates 1 and 2). Anthetic flowers and flower buds have been fixed in FAA (formaldehyde acetic alcohol), chemically dehydrated with 2,2 dimethoxypropane (DMP) for pollen study, or flowers have been stored in Farmers fixative for stigma study. In the latter case, for floral dissections the samples have been transferred into 70% ethanol and have been dehydrated in graded ethanol series. In both cases the samples have been critical point-dried with CO₂, have been mounted on stubs, have been sputter coated with gold, and have been investigated with a JEOL T-300 scanning microscope at 10 kV. Voucher specimens are deposited in WU (both species: *W. Till* 12021, *F. J. Hase s.n.*) and in B, HB, SEL (*G. penduliflora*, *W. Till* 12021, only).

The only data on pollen of *Glomeropitcairnia*, those of Erdtman and Praglowski (1974) but are based on acetolysed material and therefore hardly useful. According to the present study the hydrated pollen is sulcate, spheroidal to elongated and about 40 to 50 µm large (long axis; plate 2, figs. 7, 8, 11, 12). The pollen surface exhibits a reticulate exine pattern. The muri of the tectum are of equal diameter and are connected to the foot layer with short columellae (pl. 2, fig. 8). Lumina width is greatest at the proximal pole and becomes reduced towards the pollen equator and towards the aperture (germination area) respectively. The sulcus margins are not distinct but a gradual transition to the actual sulcus area is evident. This "diffuse sulcus type" (Halbritter 1992) is quite frequent in Bromeliaceae pollen, especially in that of members of subfamily Tillandsioideae. There are no significant differences in size and morphology of the pollen of the two species. In *G. penduliflora* the proximal lumina width and their reduction towards the sulcus is perhaps more distinct than in *G. erectiflora*. The sulcus area of the former species seems to be more covered by exine elements than it is in the latter species (plate 2, figs. 9,10) but this difference is caused merely by different states of hydration and extention respectively.

Brown and Gilmartin (1989) described the stigma of *G. penduliflora* as "distinctive and thus far unique". They find "the three style-lobes fully connated at their margins to form an inverted-umbrella-like membranaceous stylar blade which lacks papillae and is undulate and irregularly folded". However, they stress that this conformation may not be free from artifacts. In a subsequent paper (Gilmartin *et al.* 1989) this description is repeated nearly identically and is accompanied by a SEM picture.

The present results demonstrate that the stigma morphology of both *Glomeropitcairnia* species is very similar to each other. The three stigma lobes are not twisted but are cup-shaped, are in horizontal position and their undulated

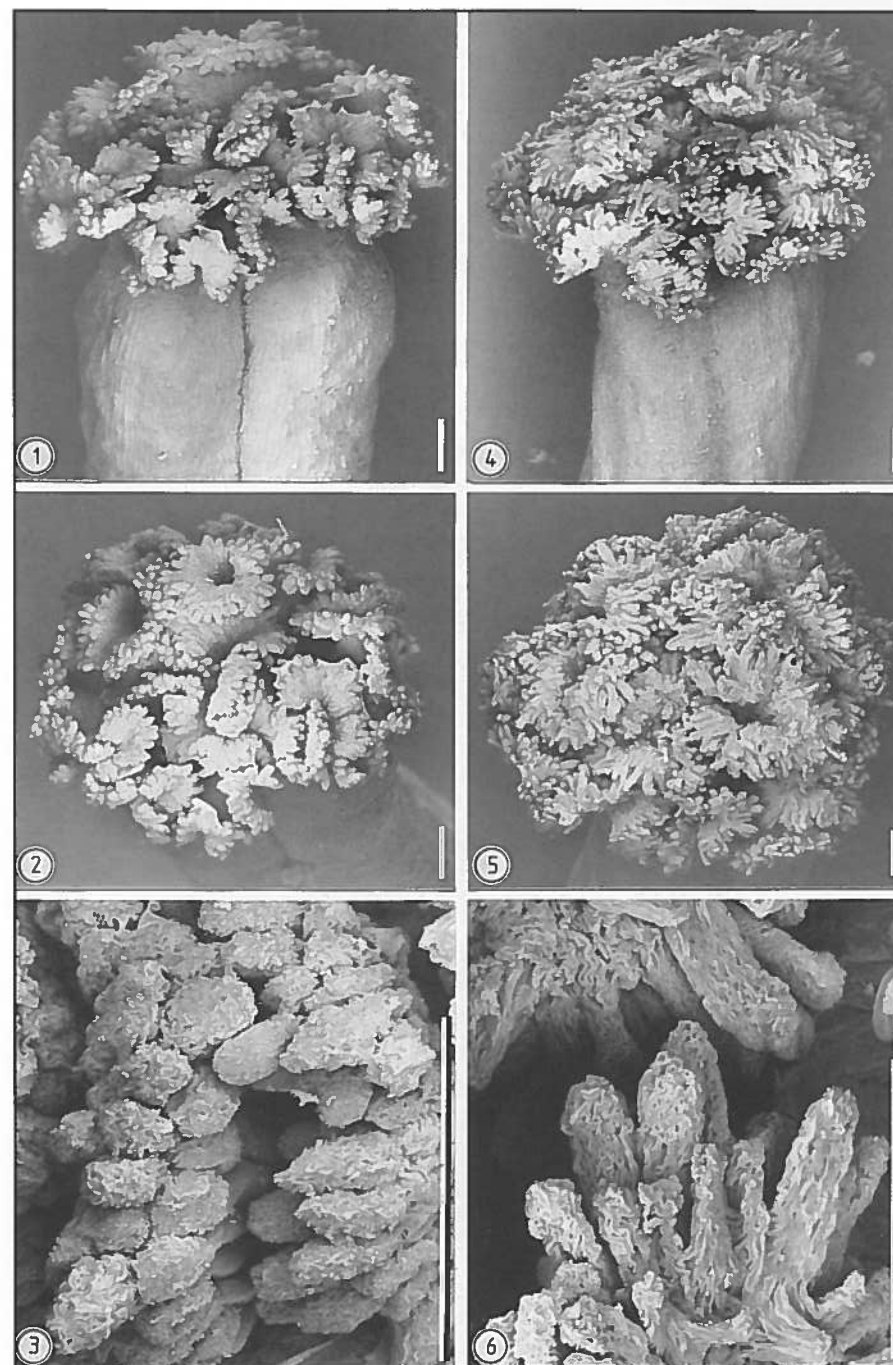


plate 1: Stigma of *G. penduliflora* (1-3) and of *G. erectiflora* (4-6). Bar = 100 µm. 1): Convolute-blade stigma type, from young bud; 2): the same, top view; 3): young stigma papillae with folded cuticle. 4): convolute-blade stigma type, from early anthesis flower; 5): the same, top view; 6): fully developed stigma papillae with folded cuticle.

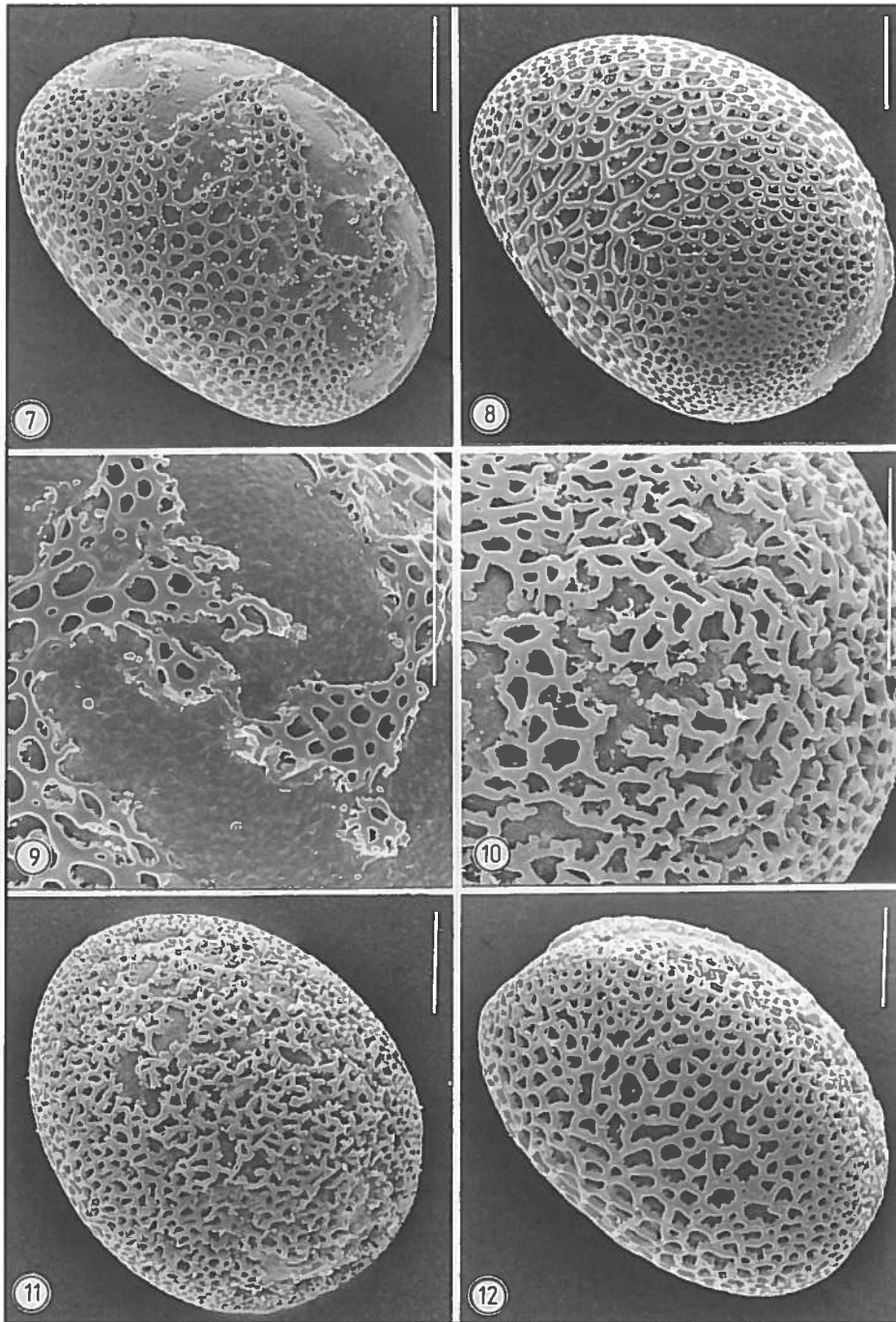


Plate 2: Pollen of *G. erectiflora* (7-9) and of *G. penduliflora* (10-12). Bar = 10 μ m. 7): distal view with germination area (aperture); 8): proximal view; 9): detail of the sulcate aperture. 10): detail of the sulcate aperture; 11): distal view with the aperture; 12): proximal view.

margins are intensively folded. Stigmas of *Glomeropitcairnia* belong to the "convolute-blade type" (Brown and Gilmartin 1989) which obviously is autapomorphic for (= restricted to) subfamily Tillandsioideae and is met there also in *Guzmania* and *Vriesea*. In both species of *Glomeropitcairnia* stigma papillae are well developed. In comparison, the papillae of *G. penduliflora* (plate 1, figs. 1-3) are shorter than in *G. erectiflora* (pl. 1, figs. 4-6). However, the illustrated stigma of *G. penduliflora* is from a young bud while that of *G. erectiflora* is from a flower just before anthesis which might explain the differences. All papillae exhibit an intensively folded cuticle. Similarly folded cuticles of stigma papillae occur among certain *Vriesea* spp. and *Tillandsia* spp. Stigmas of anthetic flowers are completely covered with germinated pollen grains.

The data of pollen and stigma morphology support the retention of *Glomeropitcairnia* within subfamily Tillandsioideae as proposed by Gilmartin et al. (1989). The diffuse aperture type of the pollen and the convolute-blade type of the stigma are very similar to that found in *Guzmania patula* Mez & Wercklé or in *Vriesea oligantha* (Baker Mez (*Vriesea* sect. *Xiphion*), indicating a closer relationship of these genera or their segregates respectively. The taxonomic value of the folded cuticles of the stigma papillae remains unclear. However, folded cuticles are rare within Bromeliaceae. Gilmartin et al. (1989) resolved a cladogram with a *Glomeropitcairnia*/*Mezobromelia*/*Guzmania* lineage which is partly corroborated by pollen and stigma features. However, Terry and Brown (1996), which have resolved *Glomeropitcairnia*, *Vriesea* sect. *Xiphion*, and *Mezobromelia* as to be basal to the rest of the Tillandsioideae (*Catopsis* excluded), have proposed *Guzmania* as to be terminal branches of their cladograms in a position far remote from *Glomeropitcairnia*. These latter findings are not supported by the present morphological data.

The seeds with a pappose appendage on both ends and the imperfectly dehiscent capsules remain as unique features and exhibit *Glomeropitcairnia* as a genus which obviously has branched off early during the evolution of subfamily Tillandsioideae. This view is supported both by Gilmartin et al. (1989) and by Terry and Brown (1996). Consequently, *Vriesea* sect. *Xiphion* must be considered as similarly basal to the Tillandsioideae clade. The position of *Guzmania* should be re-considered.

ACKNOWLEDGMENTS

We are grateful to Dr. Colmore S. Christian, Director of the Forestry and Wildlife Division of the Ministry of Agriculture, Roseau, for his support in Dominica, and to Dipl.-Ing. Franz J. Hase, Bochum, Germany, for providing the materials of and informations on *G. erectiflora*.

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Internet Addresses Needed for Directory

This may be of only passing interest to those of us who still remain cyber-challenged, but consideration is being given to adding e-mail addresses to the next BSI directory. Membership secretary Carolyn Schoenau is in the process of assembling those addresses now and would like anyone who wants their e-mail address listed in the directory to contact her at BSI@nervm.nerde.ufl.edu.

Speaking of e-mail addresses, Publications Chair Sally Thompson has changed hers. Her new address is mgtsat@juno.com

Discovery of a Variegated *Guzmania*

Lee Moore

Photograph by the Author

It has always been the aspiration of every bromeliad collector to find a variegated variety of an important species in the wild. After 39 years and over 250 expeditions to the tropical Americas, I have finally found one. Here is its story.

In August, 1996, I guided a small group of enthusiasts to the eastern slopes of Ecuador to the Amazon jungle on the Napo to the foothills further south to Tena and Puyo. Our expedition consisted of 6 members. Myself and my wife Chady, Dr. Sam and Hattie Lou Smith, Ed Gudat, and Andy Vissicchio.

During our 10 days of traveling through spectacular canyons on the eastern slopes of the Andes and a river trip on the Río Napo, we found great varieties of heliconias, aroids, and bromeliads. The most significant variety found was a pink bracted *Aechmea zebrina* in a small area around Tena. We had thought that we had located another variety the *Aechmea chantinii* 'Pink Goddess' like the single variety that I had found in 1962 in Iquitos, Peru from which all 'Pink Goddess's come today. But after obtaining the plant in hand (not through binoculars), we realized that it was a pink form of *Aechmea zebrina* which was, nonetheless, an important find.

From Puyo we proceeded up the road to Baños. This road was closed to normal traffic because of new tunnels and wider roads being constructed. Even though certain points were posted with signs indicating "Peligro" (Danger), with skull and cross bones alerting the traveler of the danger of falling boulders and landslides, we decided to be adventurous and go anyway.

Along the way were myriads of spectacular large plants of *Vriesea buseri* with fresh towering red inflorescences growing along the road on the hillsides. Further along we began seeing large plants of *Guzmania weberbaueri*. There were a few dried inflorescences to be seen but then Andy Vissicchio let out a scream to stop. He had seen what the rest of us had missed...a very large plant with a fresh inflorescence of bright orange and yellow. It was quite a spectacular thing to see. It was only 30 feet up the steep muddy bank along the road but it was still difficult to get a foothold to reach it. I slipped and slid up the bank to reach the plant that he had found to pry it out of the ground with my machete. After throwing the plant down to him and awkwardly trying to return by hands holding on to loose rocks and with a slippery footing, I took another look upward into the empty area from which the plant had come. There it was! Voila, a variegated bromeliad that had been hidden behind the one I had just removed from its place. The chance of such a find is great indeed. Such luck I should have with the Florida Lotto!

Since this plant was found at about 4,500 ft. elevation, I brought it back to Nat Deleon with the hope the he could establish it in his cool house in Miami. Perhaps the genes of this plant may be passed into some of the hybrids that Nat is famous for making. Hopefully, if it survives, the pups may be propagated for collectors in the future if the variegation remains true.

Anyway, it is always a major accomplishment to find a variegated species in the wild and I am pleased that I finally found one after so many years.

Miami, Florida



Figure 9.
The long sought prize, a variegated form of
Guzmania weberbaueri

An Idea for Increasing BSI Membership

The San Diego Bromeliad Society has come up with an approach to help increase BSI membership which might be emulated by other affiliates. A BSI membership is part of each month's raffle and the lucky winner receives a one-year membership. It is hoped that most of these winners will renew their membership when their gift subscription runs out.

Misnamed Bromeliads, No. 17: *Aechmea eggersii* Harry E. Luther

Aechmea angustifolia Poeppig & Endlicher is a variable and widely ranging species. It is not surprising that a number of variations have been named as independent species, especially as certain ecotypes or growth forms look quite different. When these are cultivated together in a greenhouse under identical conditions much of the variation disappears. This is especially true for the plants that have been named *A. leucocarpa* André; the broadly conical inflorescence produced by many plants in habitat in western Ecuador may or may not occur under cultivation. Many of the plants will produce the long, cylindrical inflorescence of *A. angustifolia*. The same can be said for *A. andradei* Gilmartin which is a high light, somewhat stressed morph. Under more lush conditions the plant becomes a typical *A. angustifolia*.

Another "species" also closely allied to *A. angustifolia* is *A. eggersii* Mez from southwestern Ecuador. It was distinguished by having the rachis of the branches "angled" and not "winged". In 1989 I examined the type specimen of *A. eggersii* (figure 11) and found that it in no way differs from typical *A. angustifolia* that is common around the type locality of the former species. They are clearly conspecific. What this has to do with bromeliad growers is that seed of *A. eggersii* was recently offered and I am sure that many of the resulting seedlings are now approaching maturity. In September, 1996 I flowered a plant of these *A. eggersii* seedlings (figure 10) and, as expected, the plants are *A. angustifolia*.

Marie Selby Botanical Gardens
Sarasota, Florida



Figure 10.
Aechmea angustifolia (syn. *A. eggersii*)
flowering at the Marie Selby Botanical
Gardens.

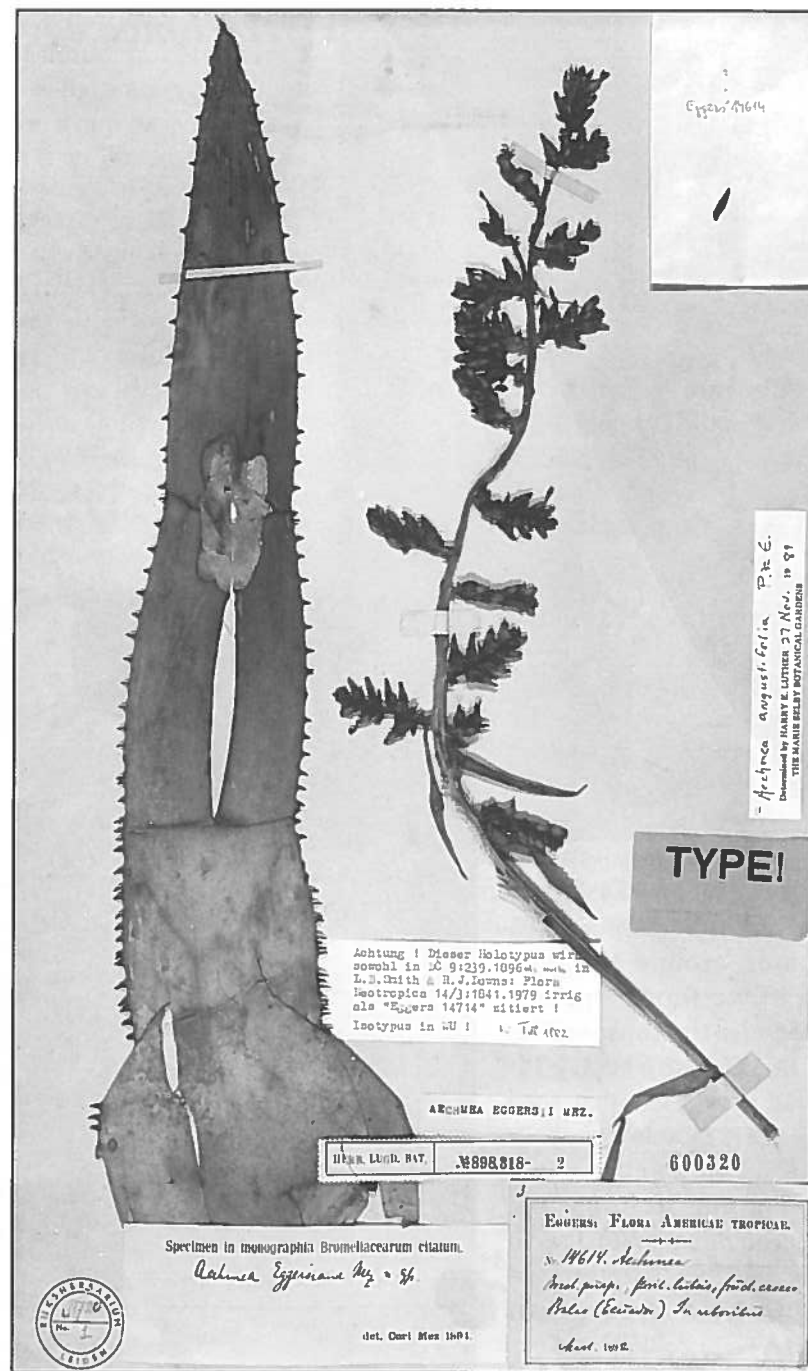


Figure 11.
Holotype Specimen of *Aechmea eggersii* conserved at
Rijksherbarium Leiden.

Typification of the Extraordinarily Black-Petaled *Tillandsia insignis*

Jason R. Grant

Photographs by the author

Edouard Morren (1833-1886) of Liège, Belgium, was preparing to describe numerous new species in an intended monograph of Bromeliaceae. One such species was a taxon he called “*Pepinia insignis*”. Morren had a manuscript description, a single dried herbarium specimen, and a painting drawn from the specimen by Jean Cambresier, also of Liège, in 1883. However, he died in 1886 before the monograph was completed or the species was published. The following year in 1887, Morren’s widow sold his collection of bromeliad paintings to the Royal Botanic Gardens, Kew, England. Among these were the still unpublished “*Pepinia insignis*.” When the Englishman, John Gilbert Baker of that institution published his *Handbook of the Bromeliaceae* (1889), he validated many of Morren’s unpublished names based on the paintings. In this work Baker (1889:142) provisionally described the painting labeled as “*Pepinia insignis*”. Although the description was adequate, the species was not validly published because he did not accept the name (Art 34.1, Greuter *et al.* 1994).

Several years later, Carl Mez of Breslau, Germany [known today as Wrocklaw, Poland] in his first monograph of the Bromeliaceae (1896:916), described the taxon as *Guzmania insignis*, noting the existence of Baker's "Pepinia insignis". Mez did not regard "Pepinia insignis" as validly published considering it a mere "nomen" in Baker (1889). Mez did not use the painting at Kew that Baker had utilized to describe "Pepinia insignis". Rather, Mez based his description on two herbarium specimens; one that Morren himself had annotated, *Pfau* 229 at Liege (LG) and another that Mez found in Brussels, *Pittier*

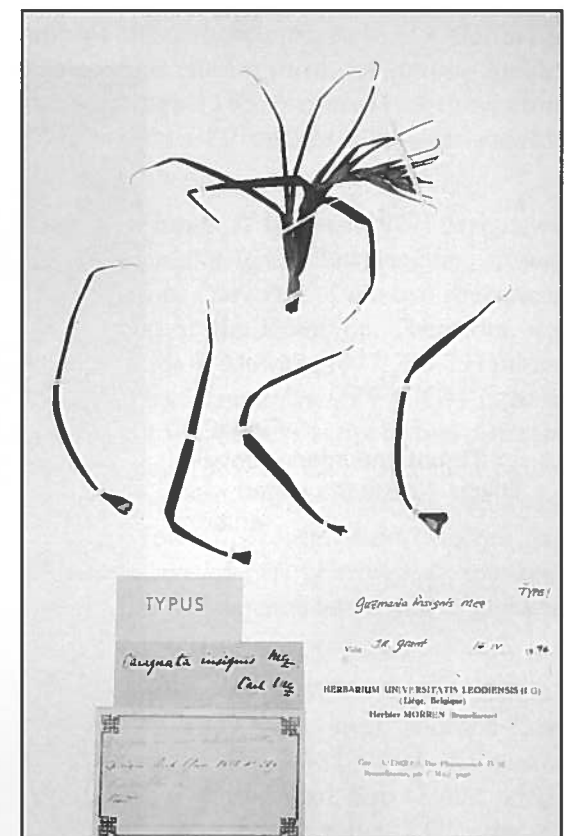


Figure 12.
The new lectotype at Liège, Belgium



Figure 13.

Habit of *Tillandsia insignis* along roadside cut near the Fortuna Dam, western Panama.



Figure 14.

Throat and interior detail of flower. Notice the united white anthers.



Figure 15.

Lateral view of flowers with jet-black petals and bright-red sepals and bracts.

813 (BR). In his second monograph of the Bromeliaceae, Mez (1935:413) transferred the species to *Thecophyllum* and cited a third collection, *Tonduz 12688* (G,US). Later, Smith & Pittendrigh (1953) dissolved the genus *Thecophyllum* and transferred the species to *Tillandsia* where it remains dubiously today.

Since Mez never designated a holotype, Smith & Downs (1977) designated the painting at Kew as the lectotype of *Guzmania insignis*. However, the painting is not original material since Mez did not cite it. Only one of the two specimens cited in the original publication by Mez can be the lectotype. Therefore, the lectotypification of *Guzmania insignis* in Smith & Downs (1977:790-791) must be superseded. A new lectotypification based on *Pfau 229* (LG!) is here proposed. On the original label on *Pfau 229* at LG, there is script in two different hands. The dark-lettered "Chiriqui Rich. Pfau 1883 no. 229" and then below "froid" may be assumed to be that of Pfau. The lighter print above and below the former is the distinctive handwriting of Édouard Morren. Here, Morren has written "*Pepinia insignis vel modesta*" ("*Pepinia insignis* or *modesta*", meaning that he perhaps had not made up his mind as to which name he wanted to give the species), and then below "Pas de Fleur" (no flower).

Guzmania insignis Mez in C.D.C, Mon. phan. 9:916. 1896. *Pepinia insignis* E. Morren ex Baker, Handb. Bromel. 142. 1889, nom. inval. *Thecophyllum insignis* (Mez) Mez, Bull. Herb. Boissier ser. II, 3:131. 1903. *Tillandsia insignis* (Mez) L.B. Smith & Pittendrigh, J., Wash. Acad. Sci. 43:402. 1953. TYPE. Panama. Chiriqui: Chiriqui, 1883, *Pfau 229* (lectotype LG!, selected

[Continued on page 86]

Small Plants for Indoor Spaces

Herb Plover

Since many bromeliad collectors, if not the majority of them, grow their plants on window sills, under lights, or both, this topic deserves further exploration. That this interest is not exclusive to New York is indicated by a recent article on small bromeliads published on the internet by a Wisconsin grower and by the interest shown at various presentations I have given to BSI affiliates in different parts of the country.

The Wisconsin correspondent defined a small plant as no more than one foot in diameter and height, although the horizontal spread is the more critical of the two dimensions. Plant height is a factor when grown under lights, but you can grow a 1 1/2 foot tall (or even taller) bromeliad in the window area.

Most window sills are only 5 or 6 inches deep, which is comfortable only for miniature plants. You can extend the depth of your sills by mounting a shelf flush with the sill, which will easily accommodate plants with up to a 24 inch diameter. There are hundreds of small or medium-size bromeliads meeting those qualifications that can be grown, so your choice will depend upon the available light and your personal preference in plants.

In preparing a list of potential species for consideration, I do not even bother to list epiphytic tillandsias since there are literally hundreds of small species and hybrids that can be grown in the windows or under lights. Since I started my high strength fertilizer regimen, many plants which I used to consider of medium size are now flowering at a small enough size to fit on an extended window.

The following is just a sampling of the possibilities:

Aechmeas

A. brevicollis is easy to grow but not easy to flower. *A. nudicaulis* is a straight-up plant with little horizontal spread which is both easy to grow and to flower. *A. racinae* a small, upright plant with a pendant, berry-type inflorescence with flowers of red bracts and yellow petals which, as an added bonus, frequently flowers during the winter. All of the plants above require at least medium to strong light to do well.

Guzmanias

As a general rule, guzmanias will do well in low to moderate light, either on the window sill or under lights. *G. sanguinea* var. *brevipedicellata* can be found in a narrow-leaf clone or a shorter, broader-leafed form. The latter clone is harder to find. There was a spectacular clump of this clone on display at the recent World Conference in Orlando which had three heads.

This plant is an "upper-pupper" and I had thought that it only produced one pup. I always wondered how growers managed to get multiple heads. The answer appeared shortly after my *G. sanguinea* var. *brevipedicellata* finished flowering. It is now putting up four upper-pups. I don't know if this is due to high strength fertilizer, clonal genes, or both, but if I keep them growing together without separating them, I'll have a clump with four heads.

Billbergias

Most non-spreading billbergias will fit on a window sill because of their upright habit, but most will still need strong light, with the possible exceptions of *B. leptopoda*, *B. nutans*, *B. X Windii*, and *B. 'Fantasia'* which may need long periods of darkness to set bud. If you grow them in a location where you might typically keep lights turned on for long periods and until late at night, they may be reluctant to flower. If this occurs, try moving them to another location. Their inflorescences are the most beautiful of the family, but they are also among the most short-lived, lasting only about a week in color.

Catopsis

These plants are really easy to grow indoors. Most require low to moderate light and will even grow well when mounted epiphytically. They should be soaked every ten days to two weeks along with your tillandsias. They root easily on bark or a twig. I've been successful with *C. nutans*, *C. morreniana*, *C. subulata* & *C. sessiliflora*.

Cryptanthus

Almost any of the commercially available crypts will fit on a window sill and thrive there. They also do well under lights, where I think they color up even better. You have to test by trial and error to find the best location and light for each plant.

In Florida and California, *Cryptanthus* 'Elaine', when grown under lath or in greenhouses, can get too much sun and loses its dark brown, barred center rib, thereby turning pink all over without margins. Indoors, I think it gets the best markings under strong fluorescent light or on a sunny east window. A mature *C. 'Elaine'* will not fit on a skinny window sill, but you can keep it relatively compact by growing it in a 4 to 4 1/2 inch shallow pot.

The same is true for the beautiful *C. marginatus* 'Arlety'. In a small pot under lights it grows compactly and gets a most brilliant pink-fuchsia color. I have seldom seen *C. 'Black Mystic'* with really black foliage, but I get close to that with a very dark brown-green under strong fluorescent light (I use a combination of VitaLite and Verilux). Otherwise, most of the time the plant assumes a shade of dark brown or green.

Neoregelias

N. ampullacea, *N. liliputiana*, *N. olens*, *N. pauciflora*, *N. punctatissima*, and *N. tigrina* are all cute, small, mostly stoloniferous plants that will need medium to strong natural light to prosper. If given it, they will quickly multiply and form clumps and clusters in even a small pot.

Nidulariums

N. billbergioides comes in forms with orange or yellow bracts and white flowers, as well as solid green, variegated, or maroon leaves. The yellow bracted form is often inaccurately called "var. citrinum". The newly described form, *N. billbergioides* forma *azureum*, has red bracts and blue flowers. *Nidularium burchellii*, *N. microps* forma *bicense* normally grow under low light conditions in their natural habitat but they do best for me under at least medium but preferably strong light.

Quesnelias

Most species of this genus are too large for a window sill, but *Q. marmorata* and *Q. lateralis* are exceptions. The later species, however, is scarce and has only recently come into circulation. Both of these plants are mainly upright growers and don't spread very much. *Q. marmorata* is a tall tubular plant whose mottled leaves recurve and curl. Both the habit and bright inflorescence of red bracts and blue flowers resemble a billbergia. An especially attractive cultivar *Q. marmorata* 'Tim Plowman' has leaves which tightly curl under in watch-spring fashion.

The inflorescence of the scarce *Q. lateralis* comes out from a lateral or basal leaf axil and not from the center. It is small and generally tubular.

Vrieseas

These are ideal houseplants which tolerate a wide range of light conditions. There are also many species and hybrids of the right size to choose from. Some of the best are *V. bleheri*, *V. carinata*, *V. flammea*, *V. guttata*, *V. heliconioides*, *V. lubbersii*, *V. rodigasiana*, *V. racinae*, *V. simplex*, *V. sucrei*, *V. triligulata*, *V. 'Ella'*, *V. 'Fire'* (a miniature *V. splendens*), and *V. 'Julie'*.

New York, New York

Reprinted in part from the monthly publication of the New York Bromeliad Society
BROMELIANA 33 (8):2-3.

Notice of Vote to Change the Name of the Bromeliad Society, Inc.

The Board of Directors voted at their annual meeting in 1995 to change the name of the BSI from **The Bromeliad Society, Inc.** to **The Bromeliad Society International** to more accurately reflect the true scope and purpose of the society. The board also felt that the change would be a way of recognizing the contributions and importance of all its members throughout the world. The generally used acronym, BSI, would be applicable to either name.

Since the name change would alter the description used in the original charter of the society, the change requires ratification of the board decision by a vote of the general membership.

The outcome of the name change will be determined by a simple majority of votes cast either FOR or AGAINST the name change. The voting procedure will be to drop a note to the society's recording secretary which is to include the following information:

- 1). Your vote FOR or AGAINST the name change.
- 2). Your name PRINTED LEGIBLY, and
- 3). Your signature

A vote FOR means that you approve the name change to the **Bromeliad Society International**.

A vote AGAINST means that you wish to retain the current name of the **Bromeliad Society, Incorporated**.

To be eligible to vote you must be a current member in good standing (dues paid) of the BSI. Your ballot must be received by May 31, 1997 to be counted, and must contain all three items of information (vote, printed name, & signature) to be valid. Please take the time to vote. The board recommends approval of the name change but needs your confirmation and/or feelings for or against it.

Your ballots should be sent to:

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Results will be announced at the 1997 meeting of the Board of Directors and be published in the subsequent issue of the JOURNAL OF THE BROMELIAD SOCIETY.

Jerry Raack
President, Bromeliad Society Incorporated.

Brazil

(Selections from the book BRAZIL) by Mulford B. and Racine Foster

[This installment concludes this series of excerpts from the Foster book. Former editor Tom Lineham began printing the installments in Volume 45 number 6 (July-August 1995), and was gracious enough to continue selecting and preparing the segments from the book after turning over the reigns as editor at the end of 1995. We would like to express our appreciation to him for his efforts...CHB]

XI

OUT TO MATTO GROSSO—THE FAR WEST

In the concluding chapters, the Fosters describe their remarkable trip by rail northwest from São Paulo approximately 800 air miles (1270 km) to Porto Esperança and from there by river boat to Corumbá on the Paraguai river. With more time and money they probably would have travelled even farther into "the wildest part of Matto Grosso and found for ourselves, who knows what?" Outward bound, they luxuriated in a private car provided by the director of the railroad Noroeste do Brasil. Their return trip was by freight car. Collecting began only after reaching Corumbá where they found *Tillandsia loliacea* and *T. streptocarpa* on "arid air gardens of the sparsely wooded sections."

They travelled to Urucum, the highest point in the area and then, unable to get local help, chopped their way through the dense growth of vines and bamboo.

At long last, well ready for a rest, we found an oasis, a glen in between the huge rocks far overhead. Here at the foot of a waterfall was running water, and cool, shade-giving trees and shrubs overhanging a flat piece of rock just large enough for the two of us to find a resting place. At last we had reached the first crest but not yet the top. The time of day and the fatigue that possessed us both decided that we would never reach the top, at least not that day. All around us were giant rocks cooling but also grueling as we tried to climb them. The sheer dark maroon walls of almost pure manganese rocks which rose up in back of us made an exquisite backdrop for the setting of this little "garden of the gods" we had found. It was dramatic and yet restful. A haven for ferns which have never ventured far from this spot. Orchids were in the air gardens of the tall trees and bromels were clinging to the crevices of the rock walls. There were cacti too, lovely golden-spined clusters like mounds of pincushions.

As restful as this spot was and as needful of rest as was Mulford, still it made him so restless that his eagerness got the best of him and soon he was working up and up from ledge to ledge. He had spied a whirling spiny bromel and while he had never seen a *Deuterocohnia*, he called down to Racine, "I am sure that I have found a *Deuterocohnia*. I haven't seen the flowers yet but I am

not coming down until I do." With that he transformed himself into a goat and managed to climb up another 100 feet to the most inaccessible places, using the grasses and plants in many places as his only foot or handhold, ignoring the barbs and braving the loose rocks...

It was a steep and perilous climb. But those spiny plants continued to beckon. When he finally came upon them in bloom he was certain that it was that long-searched-for *Deuterocohnia*. This was the one plant more than anything else that prompted us to go to Matto Grosso. The fact that it blooms from the same flower stem for a period of six to eight years was lure and bait enough to draw us clear across Brazil, into the Matto Grosso, and now up rugged, stolid Urueum.

To see the first living plants of a genus which we had known only through botanical records was always a special thrill. The plants themselves look so much like their cousins the *Dyckias* and *Encholiriums* of Brazil or the *Hechtias* of Mexico, that neither the layman nor the botanist could tell which was which unless he saw the flower. Although the *Deuterocohnia* looked like it could be a twin to any of those three spiny cousins, the flower and flower stem bore little resemblance to its cousins.

No other known bromeliad has the fantastic habit of blooming year after year from the same branched inflorescence as does this *Deuterocohnia* (another genus named for Cohn) and we know of no other flowering plant with such a habit. When one shoot has flowered other blooming shoots appear on the same stem branches. When Mulford made a close examination of the six-foot inflorescence he discovered that under the outer covering of the stem there was a definite layer comparable to the cambium layer which is found in all dicotyledonous plants such as our common woody perennials. This was the first discovery of a cambium layer in the Bromeliad family, which is a monocotyledon. The only other instance where such a condition has been noted in monocotyledonous plants was when, recently, a few species of the Lily family were found to have a similar character.

Some of those queer *Deuterocohnias*, which show an old rugged caudex or trunk hanging down over the side of the rocky wall, reveal that undoubtedly individual plants have been there fifty or more years, clinging tenaciously on the manganese rocks where but few plants can exist.

There were a few drought-resisting ferns, cacti, and a beautiful amaryllis which found a crevice here and there where they appeared to be happy under conditions discouraging to most plants. The only other bromeliads present were two familiar *Tillandsias*, one *T. didisticha*, and the other a dwarf form of *T. lorentziana* which we had seen at Villa Velha in Parana the year before...

We had made arrangements to go into Bolivia, the border being but a few kilometers away, but now with the rainy season starting, the trucks would not be able to get through every day. With everything so uncertain about truck transportation, we decided that our collecting here must come to an end and we

would take the Monday boat back. There were two boats a week and if we could get accommodations for Monday it meant we would have time to stop along the railroad from Porto Esperança inland, in various types of country we had noted as we came out...

They did stop at various stations along the way back to the coast, searching the cliffs and swamps for plants. At one point, Mulford found Dyckia leptostachya. Later on, he collected Tillandsia decomposita by climbing "the big tree which hung out over the steep cliffs." From that vantage point he could see a great rock plateau covered with great beds of Ananas ananasoides var. nana. At another point when the train stopped, Mulford walked back several kilometers to search for, and find, a large clump of Billbergia zebrina complete with tree frogs, Hyla venulosa, that exuded a latex film.

It was characteristic of the Fosters to write: "Several times we interrupted the journey eastward from Matto Grosso for collection stopovers. Our insatiable thirst for bromels never lessened.

Envoi

Find a copy of the book if you can. Enjoy the apostrophes, the other digressions and exclamations that I have omitted. Many of them have little or nothing to do with collecting, but they provide descriptions of Brazil as it was 50 years ago and, just as important, descriptions of the Fosters and their "insatiable thirst." —TUL.

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Typification of the Extraordinarily Black-Petaled *Tillandsia insignis*

[Continued from page 79]

here). PARATYPE. Costa Rica. San José: La Palma, bois humide, 1550 m, XII 1888, Pittier 813 (BR!).

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I thank Jean Beaujean of l'Université de Liège, Belgium (LG), and Paul Bamps of Le Jardin Botanique National de Belgique, Brussels, Belgium (BR) for assistance while studying material at both institutions. I also thank James L. Reveal (MARY) for review of this manuscript.

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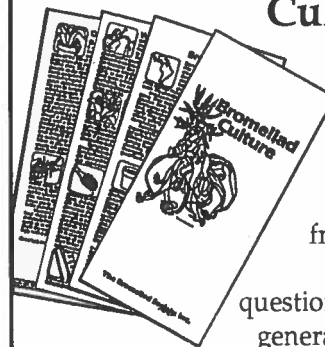
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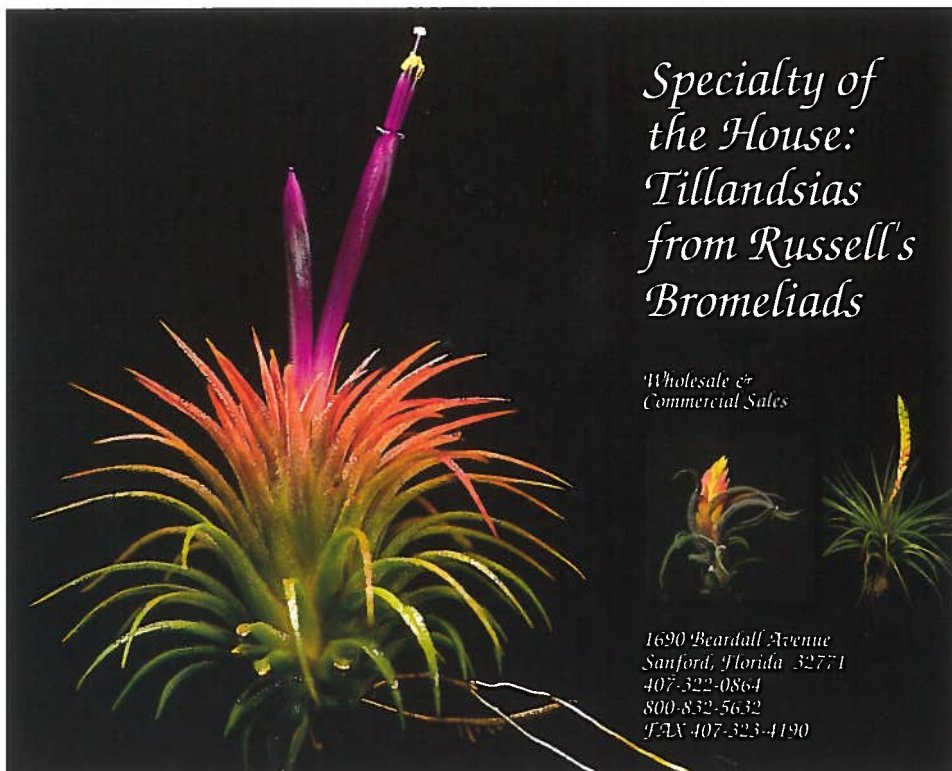
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World Conference: Thomas W. Wolfe, 5211 Lake LeClaire Road, Lutz, FL 33549.



Vriesea X Towering Flame, a specular cross between *V. sanderiana* & *V. glutinosa* made by John Arden on June 18, 1981. It first flowered in 1990 when this photo was taken.

Photograph by Chet Blackburn

Calendar

- 21-23 Mar Tarrant County Bromeliad Society Annual Bromeliad Show and Sale: Fort Worth Botanical Garden Center. Hours noon to 5 pm both days. Contact: Bobbye French 817-514-0432
- 5-6 Apr Houston Bromeliad Society's Spring Sale and Bromeliad Workshops will be held at the Houston Arboretum & Nature Center, 4501 Woodway in Houston. Hours are 9 to 5 on Saturday and 11am to 4pm on Sunday. Contact: David Whipkey 281-255-6154 or dawhip@tenet.edu
- 19-20 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 Ave., Sarasota Fla. Hours 10 am to 5 pm Saturday, 10 am to 4 pm on Sunday. Contact: Rex Rieke, 4682 Hidden River Rd., Sarasota, FL 34240
- 26-27 Apr Broward County Bromeliad Society annual show and sale; Plantation Community Center, 5555 Palm Tree Rd., Plantation, FL. Hours 10 am to 5 pm Saturday, 10 am to 4 pm Sunday. Contact: Maureen Frazell 954-474-1349
- 26 Apr Greater Dallas-Fort Worth Bromeliad Society annual show and sale: Walnut Hill Recreation Center: Hours noon to 6 pm. Contact: Bobbye French 817-514-0432
- 26-27 Apr The Bromeliad Society of Shreveport annual show and sale; Barnwell Garden & Art Center, 501 Clyde Fant Pkwy, Shreveport, LA. Hours: 1 pm to 5 pm on Saturday, noon to 5 pm on Sunday. Contact: Harvey C. Beltz 318-635-4980
- 3-4 May La Ballona Valley Bromeliad Society annual show and sale; Veteran's Memorial Auditorium, intersection of Overland and Culver Blvds., Culver City, Ca. Contact: Charlyne Stewart 310-391-4118
- 3-4 May San Diego Bromeliad Society show and sale; Casa Del Prado Building in Balboa Park; Hours are 1 pm to 5 pm on Saturday, 10 am to 4 pm on Sunday. Contact: Leslie Lanning 619-459-3095
- 17-18 May The Bromeliad Society of South Florida annual show and sale; Fairchild Tropical Gardens, 10901 Old Cutler Road, Miami, FL. Contact: Moyna Prince 305-251-5289