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Back—Tillandsia species in habitat near Cajamarca, Peru. Photo by Michael Romanowski.

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Editorial Advisory Board: David H. Benzing, Gregory K. Brown, Jason Grant, Elton M.C. Leme, Thomas U. Lineham Jr., Harry E. Luther, Walter Till.

Editorial

In This Issue

Scientific

Two very large new bromeliads from the Atlantic forest of Brazil are described by Elton Leme and Ludovic Kollman: *Aechmea aguadocensis*, named for its homeland in Agua Doce do Norte, and *Hohenbergia mutabilis* a 2 meter high giant. Following that article, on page 66 Bruce Holst and Yuribia Arroyo describe a similarly sized bromeliad from Venezuela they have named *Lindmania vinotincta*.

Dyckia horridula Mez was described more than 110 years ago, but only recently re-discovered in the Brazilian state of Goiás, together with a new fragrant species *Dyckia mirandiana* that is similar. Both are fully described, page 71 by Elton Leme and Zenilton Miranda.

Cultivation

Herb Plever in New York has long been one of the leading authorities on indoor bromeliad culture, and on page 80 we reprint his article discussing suitable types of containers, potting mixes, and watering requirements for indoor cultivation.

Vriesea psittacina is an old favourite that has become rare in cultivation in the US. On page 84, Harry Luther explains that a recently introduced plant called "*Vriesea psittacina* var. *decolor*" is not the same species. Following that article we are pleased to bring you the outline of a very worthwhile project initiated by the Bromeliad Society of South Florida, aimed at rescuing and preserving older bromeliad species and cultivar clones in cultivation. This is the type of project that could be taken up by bromeliad societies and isolated enthusiasts worldwide, and BSSF would be pleased to co-operate and discuss the mechanics of setting up this project with anyone who is interested. Contact Alan Herndon at Alanherndon@aol.com or if not on the internet write to the editor and I will pass on your interest to him.

Tillandsia lotteae is popular with enthusiasts, but hard to source (at least outside Europe.) On page 87 we have a brief discusssion of efforts to obtain seed from this species in cultivation.

General Interest

The countdown is continuing to the World Bromeliad Conference 2010 in New Orleans next July, and the organisers have released a preliminary schedule - see page 89. Last year BSI gained two new affiliate societies, the Austin society from Texas and Gainsville from Florida. On page 90 we have a history of the Gainsville Bromeliad Society followed by an advertisement from the BSI Affiliates Chair!

"Uncle" Derek Butcher retired as BSI Cultivar Registrar last year, and on page 92 we introduce his replacement Geoff Lawn. Geoff is also an Australian, however we hasten to re-assure worried US members that Australians are not really taking over our Society.... their numbers, boosted by the Cairns Conference, are dwindling already!

On page 93 we introduce another two BSI Directors taking office from 2009-2010: Holly Mena representing California, and Gary Lund for Florida. Our events calendar and member-only seedbank are on page 94.

Mick Romanowski from Melbourne is a serious collector who has travelled through South America, and he has kindly sent us some outstanding habitat photographs. The one on our back cover is a rather incongrous combination of native Peruvian epiphytes and lush green Australian eucalypts. Mick was horrified to see in Peru the extent to which these Australian trees, prized for their rapid growth and provision of timber, are being planted in place of native forests. Unfortunately, the native epiphytes suffer badly because of the bark-shedding characteristic of the introduced species.

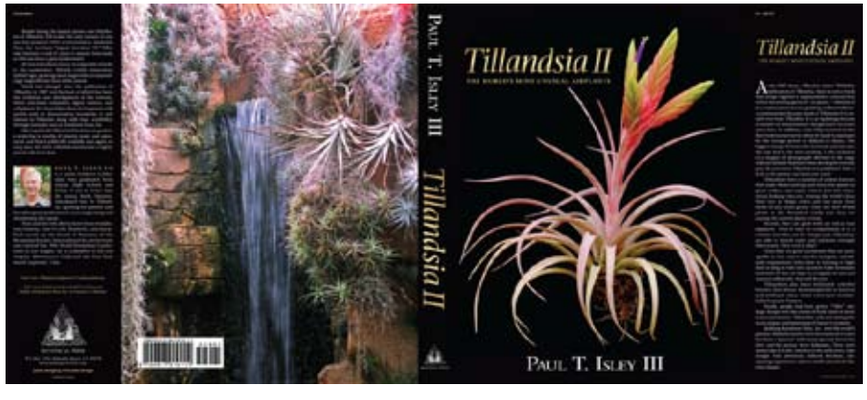
NEWS

On April 11, 2009, Bill Baker of California Gardens in Tarzana, California passed away from a heart attack. Bill worked with many plant groups: bromeliads, cactus, and succulents. He collected, hybridized, and selected from existing collections in order to offer eye-catching plants with great names. He generously shared his plants and his knowledge about them; the programs he presented were always entertaining with lots of good information and almost unbelievable adventures. Bill will truly be missed.

Just from the BSI Cultivar Registry, his legacy includes 33 cultivars.

Dan Kinnard.

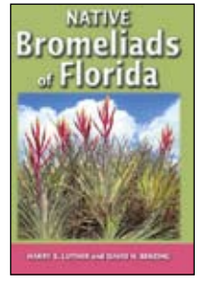
Upcoming Books



Back in 1987 Paul T. Isley III published *Tillandsia: The World's Most Unusual Air Plants*. Large format, 250 pages with excellent full color photographs and a wealth of information, it became an instant classic - still sought after today. Now, 12 years later, Mr Isley has completed a second book Tillandsia II. This is promised to be completely

new, same size and quality as the original Tillandsia. There is a new photographic chapter on hybrids, and more cultivar photos placed alongside each species they belong to. Retail price is expected to be $70 plus $6 shipping for USA residents.

Harry Luther and David Benzing have collaborated to produce *Native Bromeliads of Florida*. The book explains how to identify and appreciate Florida's 16 native bromeliad species and 2 natural hybrids.



Both books will be available through our members-only bookstore when published, so email publication@bsi.org to reserve your copies now!

BSI Online Forum

You can now join our brand new online forum at http://forum.bsi.org/ There are individual sub-forums for General topics, Taxonomy, Events, and BSI Journal.

Those of you who find part of our Journal "too technical" are very welcome to ask for clarification in the Journal forum section - non-technical questions also ok!

Bromeliad Society International. Membership Rates

United States Membership (includes bulk mail rate—first class add $5 per year)

	1 Year	3 Years
Individual	$40	$110
Dual	$40	$110
Affiliate Society	$25	$75
Institutional	$45	$125
Commercial	$60	$170
1st class mail	+$5	+$15

International Membership (includes Airmail delivery)

	1 Year	3 Years
Individual	$45	$125
Dual	$45	$125
Affiliate Society	$30	$90
Institutional	$50	$140
Commercial	$65	$185

Life Membership (*one time only fee*) $900.

Payment by check or money order payable to The Bromeliad Society International, USA members US Banks and US funds only. International members US funds only; US domestic checks, international money order, or foreign bank cheques. Credit card payments and sign-ups/renewals may be made online at www.bsi.org.

Please send mail transactions to: Dan Kinnard, BSI Membership Secretary, 6901 Kellyn Ln, Vista, CA 92084-1243, USA.

Cupulate Stigma in the Genus *Werauhia*

Harry E. Luther[1]

Figure 1. Werauhia gladioliflora flower. Photograph by Dr. Phil Nelson.

This is a good example of the cupulate stigma characteristic of the genus *Werauhia*. This specimen is a Costa Rican example of this widespread species. It is freely available but diffficult to keep in cultivation.

1 Mulford B. Foster Bromeliad Identification Centre, Marie Selby Botanical Gardens, Sarasota, FL 34236, USA

Two New Giant Bromelioids from the Atlantic Forest of Espírito Santo, Brazil

Elton M. C. Leme & Ludovic J. C. Kollmann.

Figure 1. Landscape view of the habitat of *Aechmea aguadocensis* Leme & L. Kollmann, in Espírito Santo State, Brazil. Photo by E. Leme.

Species of *Aechmea* subgenus *Chevaliera* (Gaudich. ex Beer) Baker as well as some representatives of the typical *Hohenbergia* Schult. & Schult.f. are scarcely represented in herbaria due to sampling problems: their usually huge size, leaves often with large spines, and occurring as canopy epiphytes making them hard to observe and collect when blooming on the tree branches 20 to 30 m high above the ground. When facing such a "dinosaur", the field collectors have every reason to ignore these plants and leave the collecting task to another potentially "insane" botanist. Even when the species grow terrestrially, they form giant clumps that may block large areas of forest with true "leaf-walls" and hide their inflorescences, which in the less showy ones are barely elevated above the leaf rosette. This explains why the two new species described below came to light only now, despite their huge vegetative volume.

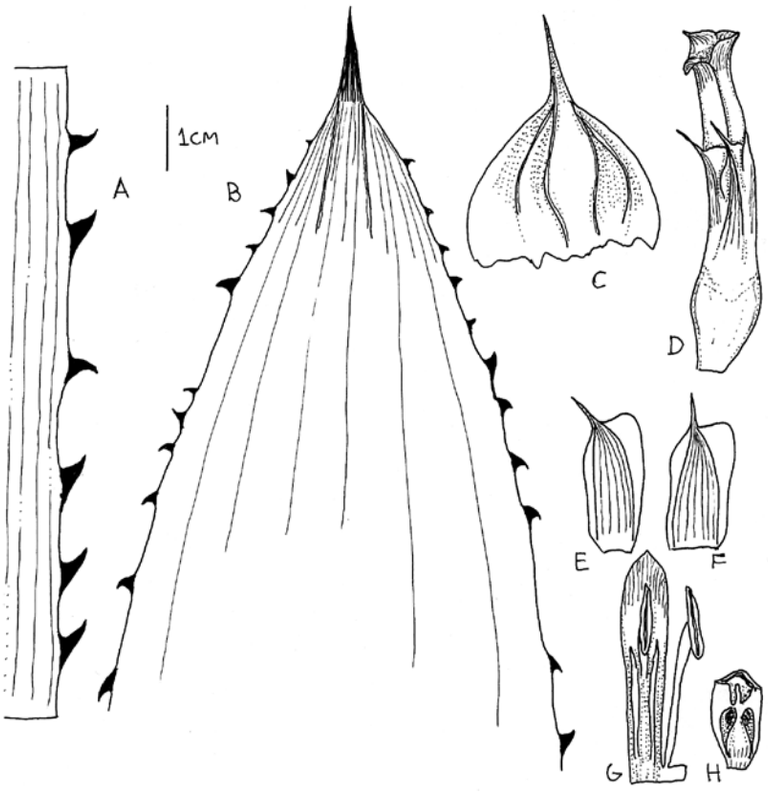


Figure 2. *Aechmea aguadocensis* Leme & L. Kollmann: a) basal margin of leaf blade; b) leaf apex; c) floral bract; d) flower; e/f) sepals; g) petal; h) longitudinal cross-section of the ovary (drawing E. Leme).

Aechmea aguadocensis Leme & L. Kollmann, sp. nov. Type: Brazil. Espírito Santo, Água Doce do Norte, Morro da Torre, terrestrial in Atlantic Forest, 18°34'14" S, 40°59'17" W, 625 m elev., 27 April 2008, *E. Leme 7370*, *L. Kollmann*, *A. P. Fontana*, O. Ribeiro & *M. Zanoni*. Holotype: HB. Isotype: MBML.

A *Aechmea cariocae* L. B. Sm., cui affinis, sed inflorescentia globoso-capitata, breviora, bracteis florigeris majoribus, suborbicularibus, floribus erectis vel fere, sepalis longioribus et pallide flavido-castaneis differt; a *Aechmea muricata* (Arruda) L. B. Sm., cui proxima, sed laminis foliorum distincte latioribus, bracteis scapigeris supernis latioribus, apice acutis et mucronatis, inflorescentia globoso-capitata, bracteis floriferis majoribus, suborbicularibus, floribus erectis vel fere, longioribus et sepalis pallide flavido-castaneis differt.

Plant often terrestrial or sometimes epiphytic, propagating by stout basal shoots; ***Leaves*** ca. 12 in number, suberect, coriaceous, forming a broadly crateriform rosette; ***sheaths*** oblong-elliptic, scarcely wider than blade, 30-35 x 17-18 cm, castaneous mainly abaxially, densely pale brown to whitish lepidote on both sides; ***blades*** sublinear, not narrowed at base, channeled at base, 120-160 x 11-13 cm wide, apex acuminate, ending in a stout blackish pungent spine ca. 1.5 cm long, abaxially completely covered

by a coarse layer of white trichomes, adaxially sparsely and inconspicuously white lepidote except for the densely white lepidote apex, coarsely spinulose, spines subtriangular, uncinate, blackish, 3-5 mm long, 8-20 mm apart, the basal ones prevailing antrorse, the upper ones prevailing retrorse. ***Scape*** stout, erect, ca. 42 cm long, ca. 35 mm in diameter, castaneous toward the base, sparsely brown lepidote; ***scape bracts*** distinctly exceeding the internodes, imbricate, completely covering the scape, coriaceous, completely covered by a dense layer of pale castaneous (toward the base) to white (toward the apex) trichomes, stramineous, distinctly nerved, castaneous toward the base and paler near the apex, the basal ones subfoliaceous, suberect toward the apex, coarsely spinose near the apex, spines prevailing retrorse-uncinate, dark brown to blackish, 2-3 mm long, the upper scape bracts lanceolate, apex acute and distinctly mucronate, 13-18 x 4-6 cm, erect, subentire to irregularly spinose at apex, spines membranaceous, irregularly surrounding the base of the inflorescence and equaling ca. 1/2 of its length. ***Inflorescence*** simple, erect, slightly exceeding the leaf sheaths, densely strobilate, globose-capitate, ca. 9 cm long, 8-9 cm in diameter (excluding the petals), apex rounded and bearing an apical coma of small sterile bracts; ***floral bracts*** suborbicular, navicular, thick-coriaceous and lignified along the median zone, membranaceous near the basal margins, bicarinate to tricarinate, enfolding the ovary, pale yellowish-castaneous except for the whitish marginal area, outside densely and coarsely white-lepidote, inside glabrous, apex acuminate and long-mucronate, 35-40 mm long, including the 10-13 mm long pale castaneous suberect mucron, 20-29 mm wide, equaling 3/4 of petals length. ***Flowers*** sessile, densely polystichously arranged, suberect to nearly erect, 50-55 mm long, odorless; ***sepals*** suboblong to subovate, asymmetrical, apex obtuse and distinctly mucronate, ecarinate, free or nearly so, pale yellowish-castaneous, densely and coarsely white-lepidote, 25-28 mm long, including the 5-6 mm long castaneous mucron, ca. 9 mm wide, thickly coriaceous except for the membranaceous, hyaline and glabrous lateral wing; ***petals*** subspatulate, apex acute and minutely apiculate, basal 3/4 white, apical 1/4 cobalt blue, erect and forming a tubular corolla except for the suberect-recurved apex, 36 x 7-8 mm, connate at base for 2-3 mm, becoming twisted and dark brown after anthesis, bearing two well developed longitudinal callosities ca. 22 mm long; ***filaments*** whitish, partially concealed by callosities, ca. 25 mm long, ca. 1.5 mm wide, complanate, slightly dilated toward the apex, the antepetalous ones adnate to petal for ca. 18 mm, the antesepalous adnate to the petals tube; ***anthers*** sublinear, base obtuse, apex acuminate, dorsifixed at middle, ca. 12 mm long; ***pollen*** ellipsoid, sulcate, exine microreticulate, lumina rounded, muri thickned; ***style*** cylindrical, whitish, ca. 16 mm long, ca. 1 mm in diameter; ***stigma*** conduplicate-spiral, subcylindrical, lobes strongly twisted, ca. 5 mm long, whitish, margins long fimbriate-papilose, papillae conspicuous; ***ovary*** subclavate, subterete to nearly trigonous, free and not fused to other ovaries, whitish, ca. 17 mm long, ca. 9 mm in diameter, placentation apical; ***ovules*** caudate; ***epigynous tube*** crateriform, ca. 4 mm long. ***Fruits*** unknown.

The name *Aechmea aguadocensis* was inspired in the name of the county where it was found, Água Doce do Norte, in Espírito Santo State, Brazil.

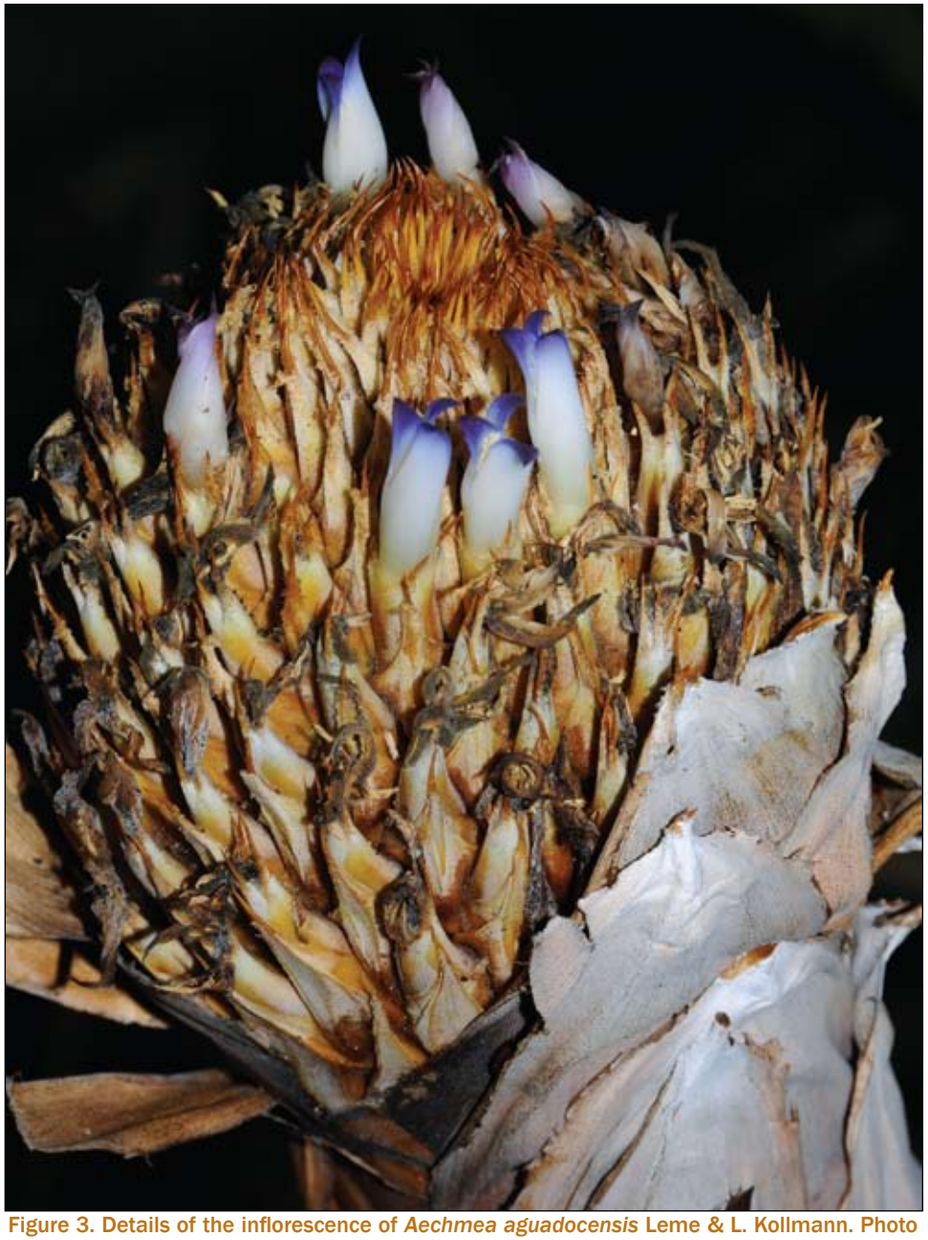


Figure 3. Details of the inflorescence of *Aechmea aguadocensis* Leme & L. Kollmann. Photo by E. Leme.

Aechmea aguadocensis is morphologically similar to *A. cariocae* but differs from it by a shorter (ca. 9 cm vs. 15-20 cm long) and globose-capitate (vs. subcylindrical) inflorescence, larger (35-40 x 20-29 mm vs. 25-30 x 12-14 mm) suborbicular (vs. obovate) floral bracts, erect flowers or nearly so (vs. subspreading), and longer (25-28 mm vs. 20-23 mm long) and pale yellowish-castaneous (vs. light green) sepals. This new species can be also compared to *A. muricata*, differing from it by its distinctly

Figure 4. Ludovic Kollmann "fighting" with *Aechmea aguadocensis* Leme & L. Kollmann when it was discovered. Photo by E. Leme.

broader (11-13 cm vs. 4-7 cm wide) leaf blades, broader (4-6 cm vs. 2.5-4 cm wide) upper scape bracts with apex acute and mucronate (vs. apex acuminate-attenuate), globose-capitate (vs. narrowly ovate to cylindrical) inflorescence, floral bracts larger (35-40 x 20-29 mm vs. 25-33 x 12-14 mm), suborbicular (vs. obovate), flowers erect or nearly so (vs. subspreading), longer (50-55 mm vs. 43-45 mm long) and by sepals pale yellowish-castaneous (vs. light green).

The discovery of *Aechmea. aguadocensis* completes the biological and geographical blank between its closer relatives, both endemic species in the coastal Atlantic For-

Figure 5. Habit of *Hohenbergia mutabilis* Leme & L. Kollmann in early anthesis. Photo by L. Kollmann.

est: *A. cariocae* grows southern, with a restricted occurrence in Rio de Janeiro State (Leme and Silva 2002), while *A. muricata* dominates in the northern territory states of Pernambuco and Alagoas (Leme and Siqueira-Filho 2006). Although *A. aguadocensis* was found growing in an area of Atlantic Forest fragment surrounding inselbergs, comparatively more distant from the coast not far from the border of Minas Gerais

state, this may only represent a collection artifact due to the already reported difficult access to blooming specimens in other sites closer to the ocean. On the other hand, this discovery attests the still under-explored status of the biological diversity of the remaining areas covered by Atlantic Forest.

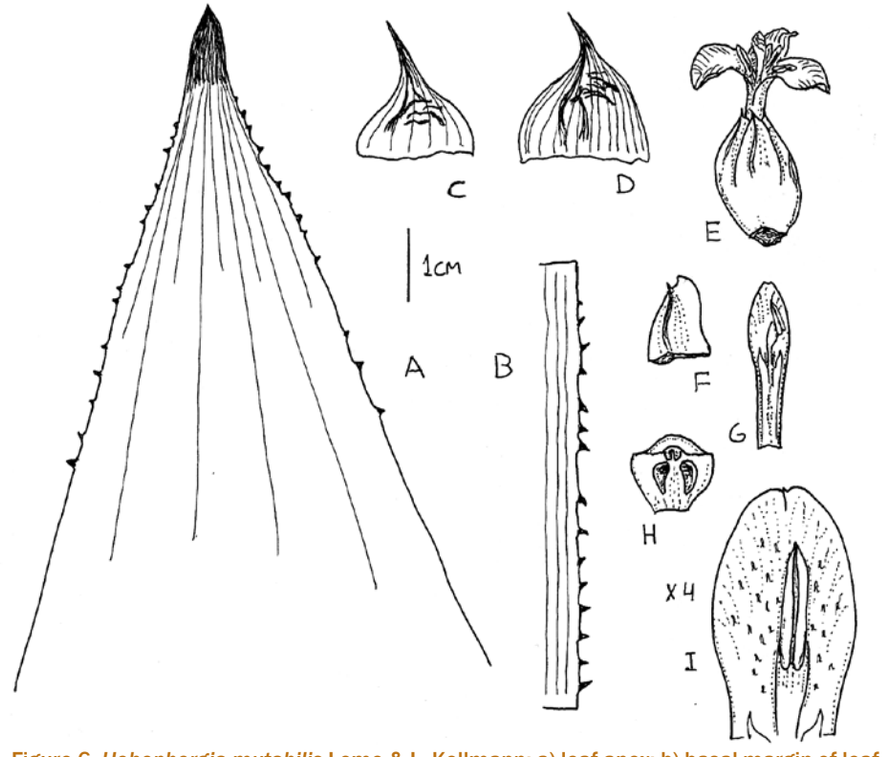


Figure 6. *Hohenbergia mutabilis* Leme & L. Kollmann: a) leaf apex; b) basal margin of leaf blade; c/d) floral bract; e) flower; f) sepal; g) petal; h) longitudinal cross-section of the ovary; i) apex of the petal. Drawing by E. Leme.

Hohenbergia mutabilis Leme & L. Kollmann, sp. nov. Type: Espírito Santo, Pinheiros, Biological Reserve of Córrego do Veado, 18º22'14,1" S, 40º08'28,6" W, ca. 150 m elev., 30 Jun. 2008, *L. Kollmann 11040 & L. Magnago*. Holotype: MBML. Isotypes: HB.

Species nova a *H. itamarajuensis* Leme & Baracho, cui proxima, sed scapus atrovinoso-purpureus, bracteis primariis quam basin ebracteatam ramulorum longioribus, peduculis ramorum atrovinoso-purpureis, floribus longioribus, petalis viridibus longioribusque et per anthesim subpatentibus recurvatis differt; a *H. brachycephala* L. B. Sm., cui affinis, bracteis primariis quam basin ebracteatam ramulorum longioribus, bracteis floriferis integris vel fere, ecarinatis, pallide flavo-castaneis, brevioribus differt.

Plant epiphytic, flowering 150-200 cm tall. ***Leaves*** 15-20 in number, coriaceous, forming a broad crateriform rosette; ***sheaths*** oblong-elliptic, 34-45 x 19-21 cm, dark

castaneous and densely brown-lepidote on both sides; ***blades*** sublinear, suberect-arcuate at anthesis, slightly if at all narrowed at base, 180-200 x 16-17 cm, green, nerved mainly at apex, abaxially densely and minutely white-lepidote, adaxially subdensely and inconspicuously white-lepidote, apex acuminate, ending in a dark, pungent spine, ca. 13 mm long, margins densely spinose, spines triangular, straight to retrorse-uncinate, blackish, 0.5-3 x 0.4-2 mm, 1-5 mm apart. ***Scape*** erect, stout, 135 cm long, 2-3 cm in diameter, dark purplish-wine, densely white-lanate but soon glabrous; ***scape bracts*** narrowly lanceolate, acuminate-attenuate, 21-34 x 2.8-5.5 cm, pale stramineous, thinly coriaceous, coarsely nerved, entire, imbricate, distinctly exceeding the internodes but not completely covering the scape, sparsely covered by fimbriate inconspicuous white trichomes. ***Inflorescence*** laxly paniculate, broadly pyramidate, tripinnate at base and bipinnate toward the apex, 65-70 cm long, 20-45 cm in diameter at base, erect, rachis white lanate but soon glabrous, dark purple-wine, rugulose, straight to slightly flexuous near the apex, 1-1.8 mm in diameter, internodes 3-7 cm long; ***primary bracts*** resembling the upper scape-bracts but smaller, narrowly subtriangular-lanceolate, acuminate-caudate, 3.5-15 cm long, 1.5-2.5 cm wide at base, entire, stramineous, thinly coriaceous, coarsely nerved, soon glabrous, suberect to spreading with the branches, equaling to exceeding the naked stipes, the upper ones pungent; ***primary branches*** suberect to spreading, the basal ones ca. 15 cm long in early anthesis to 27 cm long in late anthesis, stipes to 9 cm long, 1-1.3 cm wide, complanate, dark wine-purple, sparsely white lanate but soon glabrous, with 1 to 3 sessile secondary fascicles densely aggregated at the apex of the primary branches, the upper primary branches resembling the secondary branches, 4-6 cm long in early anthesis to 12-17 cm long in late anthesis, sessile or bearing stipes to 4 cm long, ca. 0.8 cm in diameter; ***secondary bracts*** resembling the floral bracts, distinctly shorter than the secondary branches ecarinate but bearing a protruded central nerve mainly near the apex; ***secondary branches*** suberect to spreading, densely strobilate, terete, in early anthesis ellipsoid-ovate and capitate, 3.5-4 x 2.8-3 cm, in late anthesis cylindrical or nearly so, 14-17 x 3.5-4 cm, many flowered, the upper ones sessile; ***Floral bracts*** subtriangular-orbicular, acute and slenderly long mucronate, pungent, erect to suberect-recurved toward the apex, distinctly exceeding the sepals and slightly shorter than the extended petals, 18-20 x 15-17 mm, including the 6-10 mm long apical mucron, thinly coriaceous, pale castaneous-yellow outside, sparsely and inconspicuously white lepidote with filamentous trichomes, but soon glabrous, greenish inside and toward the base, distinctly nerved mainly toward the apex, sometimes corrugate, entire or remotely denticulate, strongly convex, ecarinate. ***Flowers*** 28-30 mm long, sessile, densely and polystichously arranged, suberect, odor not detected; ***sepals*** oblong-ovate, strongly asymmetric with a subrounded wing distinctly exceeding the midnerve, ca. 10 x 6 mm, bearing at apex a mucron ca. 0.5 mm long, free, glabrous, entire, greenish except for the pale castaneous-yellow central zone, the posterior ones alate carinate with keels decurrent on the ovary; ***petals*** subspatulate, apex emarginate and inconspicuously apiculate, 20-24 x 5 mm, free, green, subspreading-recurved at anthesis, the blades sparsely and conspicuously glandulose adaxially, without any appendages but bearing 2 well developed longitudinal callosities 15-18 mm long; ***stamens***

shorter than the petals but exposed at anthesis; ***filaments*** complanate and dilated toward the apex, the antepetalous ones adnate to the petals for ca. 10 mm, the antesepalous free; ***anthers*** sublinear, 5-6 mm long, base obtuse-sagittate, apex apiculate, fixed at 2/5 of its length above the base; ***pollen*** broadly ellipsoid, biporate, psillate; ***ovary*** ca. 7 mm long, 11-12 mm wide at apex, complanate, bicarinate, glabrous, greenish, placentation apical; ***ovules*** caudate, epigynous tube crateriform, ca. 1.5 mm long, ca. 2 mm wide at apex; ***stigma*** conduplicate-spiral, capitate, slightly shorter than the anthers, white, blades crenulate. ***Fruits*** unknown.

Figure 7. Details of the flower of *Hohenbergia mutabilis* Leme & L. Kollmann in early anthesis Photo by L. Kollmann.

Hohenbergia mutabilis is closely related to *H. itamarajuensis*, at least in early anthesis, but differs from it by its dark wine-purple scape (vs. red), all primary bracts exceeding the stipes (vs. the basal ones distinctly shorter than the stipes), dark wine-purple (vs. red) stipes, flowers longer (28-30 mm vs. ca. 25 mm long), and by the petals green (vs. lilac), longer (20-24 mm vs. ca. 17 mm long), and spreading-recurved at anthesis (vs.

suberect). On the other hand, this new species also resembles *H. brachycephala* but can be distinguished from it by its all primary bracts exceeding the stipes (vs. the basal ones distinctly shorter than the stipes) and the floral bracts entire or nearly so (vs. distinctly spinulose), ecarinate (vs. carinate), pale castaneous-yellow (vs. green), and distinctly exceeding the sepals at anthesis (vs. shorter to equaling the petals at anthesis).

Figure 8. Branches of *Hohenbergia mutabilis* Leme & L. Kollmann in early anthesis. Photo by E. Leme.

This new species was found during field work conducted in the Biological Reserve of Córrego do Veado, situated in north region of Espírito Santo state, where the Atlantic forest grows on sedimentary plains of the Barreira Group and shares many plant genera and species with the Amazon Forest. *Hohenbergia mutabilis* is typically an epiphyte in the in Atlantic Forest of the tablelands so- called "Tabuleiro" forest, growing in the forest canopy about 20 m high above the ground. From time to time it is found fallen onto the forest floor, where it continues to grow and bloom allowing the study presented here.

These days the "Tabuleiro" forest of Norte of Espírito Santo is very fragmented and seriously affected by anthropic activities, but in a few reserves it is well preserved like in Biological Reserve of Córrego do Veado. Although drier when compared to montane zones, the "Tabuleiro" forest of the studied area is commonly composed of trees 30 m tall, with emergents reaching 40 m.

The name of this new species is a reference to the mutant status of the shape and size of the fertile portion of the branches when comparing its short, ellipsoid-ovate, capitate shape in early anthesis with the elongate cylindrical shape in late anthesis.

Acknowledgements

We would like to thank the Museu de Biologia Prof. Mello Leitão, as well as the Conservation International of Brazil and "Corredores Ecológicos" to financing the field work in "REBIO Córrego do Veado", and the "Prefeitura Municipal" of Água Doce do Norte, for their logistical support, as well as André Paviotti Fontana, Marcos Zanoni and Otávio Ribeiro for their support, companion and encouragement during field activities.

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A Beautiful New Species of *Lindmania*, Bromeliaceae

Bruce K. Holst and Yuribia Vivas Arroyo.

It is not often that one finds a striking new species of *Lindmania*. Several other species in the genus discovered and described in the last two decades are certainly interesting and beautiful in their own right (*L. candelabriformis* B. Holst, *L. holstii* Steyerm. & L.B. Sm., *L. oliva-estevae* B. Holst), but are somewhat dwarfed (in size and beauty) by *Lindmania vinotincta*, a new species presented below.

Abstracto. Se describe y se ilustra una nueva especie de *Lindmania* del suroeste de Venezuela en el Estado Bolívar, en la Sierra de Lema.

Lindmania vinotincta B. Holst & Y. Vivas, sp. nov. TYPE: Venezuela. Bolívar: eastern Sierra de Lema near the border with Guyana, 14-16 April 2007 (fl), 1350-1400 m, *Y. Vivas & E. Sanoja* 1688 (HT: VEN; IT: GUYN, SEL).

Lindmania vinotincta a *L. atrorosea* differt: ramis laxe floriferis usque ad 44 cm (non ramis brevibus dense floriferis usque ad 12 cm) longis, bracteis floralibus 5-8 mm (non ca. 2 mm) longis, foliis marginibus integerrimis (non basi laxe serratis), laminis 5-5.8 cm (non 1.5-3-5 cm) latis.

Terrestrial, ca. 2 m tall in flower. ***Leaves*** numerous, entire, conspicuously exceeded by the scape; ***leaf blades*** 40–50 cm long, 5–5.8 cm wide, glabrous adaxially, sparsely punctate abaxially, apex triangular-acute, margins membranaceous; leaf sheaths unknown; ***scape*** ca. 1.5 m long, to 15 mm diam., glabrous, lustrous wine-purple; ***scape bracts*** triangular, twice as long as the internodes, light green, apex acute, lanuginous adaxially, margins membranaceous; ***inflorescence*** laxly flowered, polystichously two times branched, rachis, secondary and tertiary axes lustrous wine-purple; ***primary bracts*** like the scape bracts, shorter than the sterile portion of the secondary axis, mostly sparsely lepidote-punctate, lanuginous adaxially in the proximal half, sparsely lepidote in the distal half, glabrescent abaxially, pale green, apex acuminate, margin membranaceous; ***lateral branches*** ascending to spreading at 90° angle from the rachis, the axes straight to strongly upwardly curved distally, glabrous, to 44 cm long, laxly and polystichously many-flowered, bearing short, 2- or 3-flowered spurs proximally; ***floral bracts*** triangular, incurved, 5–8 mm long, smooth, lustrous greenish with purple tinges, glabrous, apex acute, margins membranaceous; ***flowers*** relatively large for the genus, glabrous, showy, pedicellate, the pedicels to 10 mm long, some subpatent; ***sepals*** free, ovate to oblong, cucullate, 6–7 mm long, sparsely and minutely tuberculate throughout, wine-purple, apex obtuse, margins membranceous; corolla campanulate, the ***petals*** free, to 15 mm long, apex obtuse, bright pink with some inconspicuous, small irregular white markings marginally; stamens included, ca. 8 mm long, equaling to slightly exceeded by the pistil, anthers sagittate; stigma simple-erect; ***mature fruits*** and seeds unknown.

Figure 1. *Lindmania vinotincta* in 2007 prior to flowering. Photo by Bruce Holst.

Lindmania is a genus of about 40 species that are entirely restricted to the upland and highland regions of the Guayana Shield (1000–2800 m elevation). They occur in open rocky areas or in savannas or tepui meadows; all are terrestrial. Only one, or possibly two species occur outside of Venezuela (*L. piresii* L.B. Sm., from Serra Araça in northern Brazil, and possibly one other undescribed species from western Guyana).

Lindmania vinotincta was discovered in April 2005 by the senior author during an inventory of the Sierra de Lema in central-eastern Bolívar State, together with colleague Wilmer Díaz. A single, robust plant was spotted on a somewhat disturbed soil bank, and we postulated that it was a *Lindmania* due to spineless leaf margins (though some *Lindmania* are lightly armed) and the relatively broad, numerous leaves. The following year, the authors of this paper returned to the area to observe the plant, but other than

Figure 2. *Lindmania vinotincta* in full flower in 2007. Photo by Yuribia Vivas.

Figure 3. Closeup of a flower of *Lindmania vinotincta*. Photo by Yuribia Vivas.

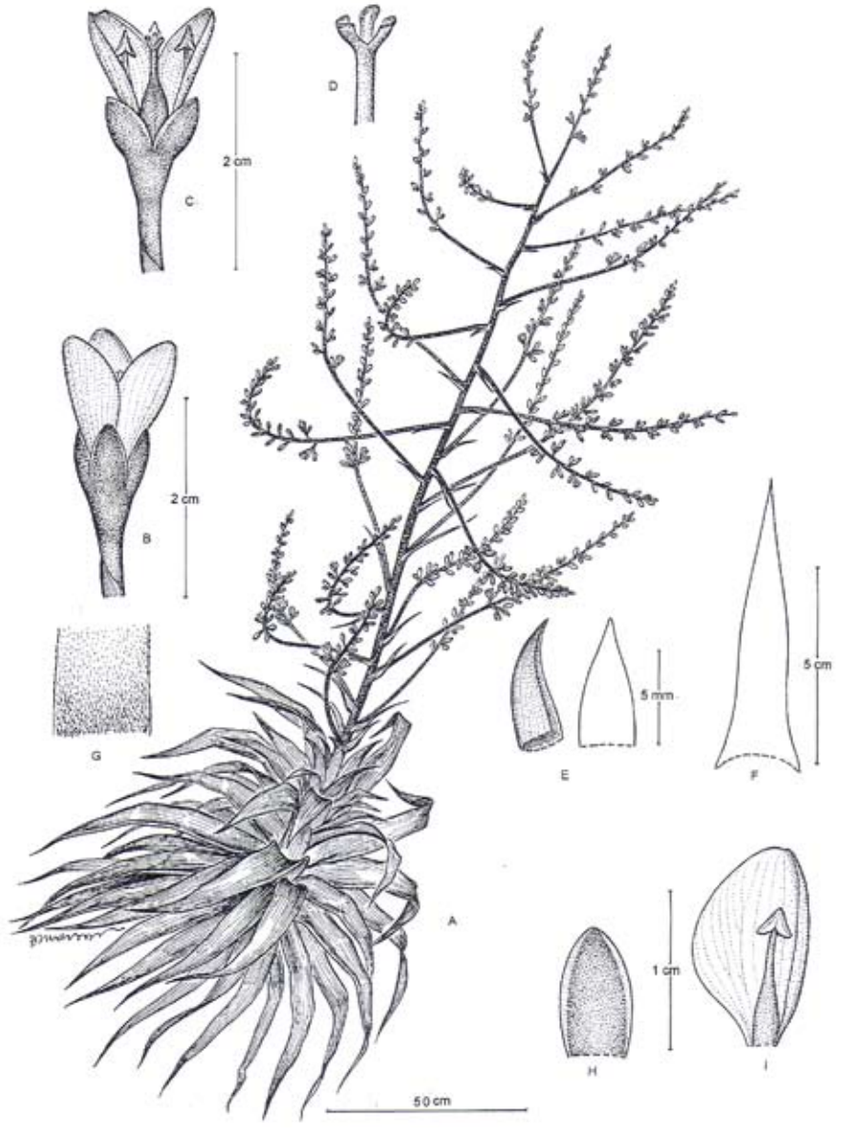

Figure 7. *Lindmania vinotincta:* a) habit; b) flower; c) flower interior; d) stigma; e) floral bracts in lateral and dorsal view; f) primary bract; g) indument of primary bract; h) sepal; i) petal and stamen. Illustration by Bruno Manara.

having more leaves, there was no indication that it was near flowering. The rosette was still growing nicely. Finally, in March of 2007 flowering had initiated, though at that point in time, the inflorescence was decidedly immature. Sadly, we could not stay for what would likely be several more weeks to see the results. We speculated widely about the final aspect of the inflorescence, and guessed that it would have a lax, short panicle with white flowers, not unlike the more common and robust forms of *L.*

guianensis that occur in the neighboring Gran Sabana. Fortunately, the second author and colleague Elio Sanoja were able to return to the population two weeks later, a 5-day round-trip, and were rewarded with the surprising and spectacular 2 m tall, wine-purple, rose-pink-flowered inflorescence. They returned again in 2008 to find remnants of the inflorescence and discovered several more young plants in the vicinity.

The new species appears to be related to *Lindmania atrorosea* (L.B. Sm., Steyerm. & H. Rob.) L.B. Sm., Steyerm. & H. Rob. of Cerro Guaiquinima, which lies approximately 240 km due west of the eastern Sierra de Lema. The two species have relatively broad leaves and showy pink flowers, but *Lindmania vinotincta* differs by having laxly flowered elongated branches to 44 cm long (vs. densely flowered short branches to 12 cm), floral bracts 5-8 mm long (vs. ca. 2 mm), entire leaf margins (vs. laxly serrate basally), and leaf blades 5-5.8 cm wide (vs. 1.5-3.5 cm). The leaf sheaths of *Lindmania vinotincta* are unknown as attempts were made to minimize damage to the sole flowering individual. The lustrous nature of the fresh inflorescence is visible in the dried specimen as an even, radiant sheen when viewed under a microscope.

As *Lindmania vinotincta* is known only from a handful of specimens and currently must be considered rare, the exact locality is not included in this article. Please contact the authors for more detailed location information.

Acknowledgements.

We thank Bruno Manara for the beautiful illustration and assistance with the Latin diagnosis, and our colleagues Wilmer Diaz, Elio Sanoja, Fernando Garcia, Omaira Hokche, Silvia Perez, Alix Amaya, Jan Tillett, and Susan Fawcett for their camaraderie in the beautiful forests of the Sierra de Lema.

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Studies on *Dyckia* from Central Brazil – Part II. Two Sweetly Fragrant Species from Goiás.

Elton M. C. Leme & Zenilton de J. G. Miranda.

During the study of the genus *Dyckia* from Central Brazil, two unusual species were found in the state of Goiás, one of them originally collected over 110 years ago and recently rediscovered, and the other one new to science. Although the two species are very distinct when comparing leaf structure and conformation, those species share curious flower characteristics such as dimension, size, color and structure.

Figure 1: Habit of *Dyckia horridula* Mez which flowered in cultivation soon after being collected at the type region. Photo by E. Leme.

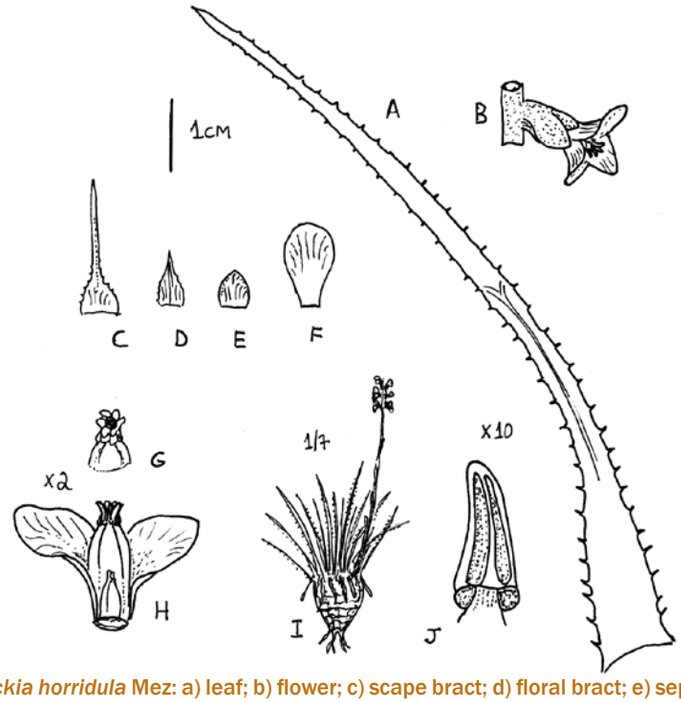

Figure 2: *Dyckia horridula* Mez: a) leaf; b) flower; c) scape bract; d) floral bract; e) sepal; f) petal; g) distal portion of the stamens; h) flower highliting the filaments and pistil position at anthesis; i) habit; j) front view of the anther. Drawing by E. Leme.

Dyckia horridula Mez, Bot. Jahrb. 30 (67): 5. 1901.

Plant terrestrial, flowering 15-25 cm high. ***Leaves*** 35-40, densely arranged, coriaceous; ***sheaths*** broader than the blades, the older ones forming a globose base, 4-5.5 x 4-5 cm; ***blades*** sublinear, nearly flat near the base, canaliculate and obtusely carinate abaxially at middle, and subulate toward the apex, suberect to nearly erect, 10-12 cm long, ca. 0.8 cm wide and ca. 0.1 cm thick at base to 0.2-0.3 cm wide and 0.2 cm thick toward the apex, green toward the base, reddish toward the apex, opaque, densely white-lepidote abaxially, trichomes not obscuring the color of the blades, adaxially sparsely and inconspicuously white-lepidote to glabrescent, nerved adaxially, apex long acuminate-caudate, pungent, margins white-lepidote to glabrous, subdensely spinose, spines 1-1.5 mm long, ca. 0.5 mm wide at base, 2-3 mm apart from each other, acicular, spreading to slightly retrorse, reddish-castaneous, glabrous. ***Scape*** lateral, erect, 9-17 cm long, 0.2-0.3 cm in diameter, subdensely or sparsely white-furfuraceous to glabrous, smooth, green; ***scape bracts*** erect, stramineous, nerved, carinate toward the apex, sparsely white-lepidote, the basal ones subfoliaceous, the upper ones with a broadly ovate-subtriangular base, margins microscopically and densely denticulate, and a long acuminate-caudate blade, to ovate and acuminate, 10-20 x 5 mm, margins inconspicuously but densely denticulate, exceeding the internodes. ***Inflorescence*** erect, 3-4 cm long, subdensely to sparsely and inconspicuously white-furfuraceous

except for the petals, subdensely flowered, rachis nearly straight, terete, smooth, green to orange-yellow, inconspicuously white-furfuraceous, ca. 2 mm in diameter; ***floral bracts*** ovate, acuminate, carinate toward the apex to ecarinate, nerved, stramineous, inconspicuously white-lepidote, ca. 7 x 3 mm, subspreading to reflexed, equaling to slightly exceeding the sepals, margins densely and inconspicuously denticulate, bearing fimbriate trichomes. ***Flowers*** 5 to 7 in number, 12-14 mm long with extended petals, spreading at anthesis, subdensely arranged, producing a strong sweet fragrance, pedicels inconspicuous, stout, ca. 2 mm long, 3.5-4 mm in diameter at apex; ***sepals*** symmetric, broadly ovate to suborbicular, convex, apex acute, ecarinate, ca. 5 x 4 mm, yellow with green apex to pale orange, sparsely white-furfuraceous, margins entire with fimbriate trichomes; ***petals*** symmetric, broadly obovate-spatulate from a narrower base, apex obtuse to slightly emmarginate, distinctly cucullate in early anthesis, connate at base for ca. 2 mm in a common tube with the filaments, ca. 10 x 6 mm, ecarinate, yellow, spreading-recurved at anthesis and forming a campanulate corolla ca. 12-14 mm in diameter; ***stamens*** distinctly shorter than the petals but distinctly exposed at anthesis by the spreading-recurved petals; ***filaments*** complanate, yellow, completely connate from the base to the apex and forming a cylindrical tube, ca. 8 mm long; ***anthers*** narrowly subtriangular, ca. 2 mm long, base truncate, apex obtuse, outside dark purplish-brown, inside yellow, fixed at base, the outside base covering like a hat the point of insertion of the filaments, basally connate to each other, distinctly recurved and free near the apex, forming a stellate structure and bearing a central entrance-hole ca. 1 mm in diameter; ***pistil*** ca. 4 mm long, completely hidden by the filaments tube; stigma conduplicate-spiral, blades inconspicuous subentire, yellow; style ca. 1 mm long, yellowish; ovary suboblong-ovate, ca. 2.5 mm long, ca. 1 mm in diameter, yellowish-white. ***Capsules*** unknown.

Type: Brazil, Goiás, Rio Descoberto near Capelinha, 19 Oct. 1894, *A. Glaziou 22194*. Holotype, B. Isotypes, P, K.

Material examined: Goiás, Santo Antonio do Descoberto, near the border to Distrito Federal, near the cemetery 16 Aug. 2004, *E. Leme 6420* & *Z. J. G. Miranda* **(**HB).

Dyckia horridula was originally collected in 1894 by Auguste Glaziou, and besides the types specimens there are very few representatives in herbaria. The taxon was recently rediscovered in the vicinity of type locality, in the periphery of the city of Santo Antonio do Descoberto. It is a typical inhabitant of the Campos Rupestres in the domain of the Cerrado vegetation, where the individuals grow sparsely distributed in rocky soils and due to its small size are hidden by the herbaceous vegetation even when in bloom, which makes the task of locating the specimens in habitat difficult.

Dyckia horridula is characterized by numerous and narrow leaves densely arranged from a thickly globose base, bearing along the leaf blades margins subdensely disposed,

Figure 3. Flower details of *Dyckia horridula* Mez. Photo by E. Leme.

delicate spines. The unusual appearance of this species certainly inspired its name "horridula", but it is far from being a "horrible little plant" as the name suggests. The inflorescence of *D. horridula* is small, with few inconspicuously pedicellate flowers that posses a campanulate corolla of spreading-recurved, yellow petals. The striking feature of this taxon are the strong sweet fragrance produced by their flowers, the completely connate filaments that form a tubular structure, hiding the comparatively small pistil, and the anthers basally connate to each other, forming a stellate structure in a top view, and bearing a small central entrance-hole which certainly is the only access of the pollinator (probably an insect) to the internal chamber formed by the filaments, where the female organs are carefully protected.

The future of *D. horridula* in its original habitat, at least around the city of Santo Antonio do Descoberto, is uncertain due to urban expansion and the consequent degradation of the surrounding Campos Rupestres and Cerrados. It is also severely affected by frequent fires and cattle breeding activities.

Figure 4. Flower details of *Dyckia mirandiana* Leme & Z.J.G. Miranda, sp. nov. Photo by E. Leme.

Dyckia mirandiana Leme & Z. J. G. Miranda, sp. nov. **Type**: Goiás, Alto Paraíso de Goiás, ca. 20 km from the city toward Teresina de Goiás, km 197 road GO 118, way to Poço Encantado, ca. 1,400 m elev., 24 July 2004, *Z. J. G. Miranda s. n.*, fl. cult. *E. Leme 6380*. Holotype, HB.

Inter generis species valde singularis, a speciebus omnibus foliis distichis vel fere, laminis foliorum utrinque distincte nervatis, marginibus sparse spinosis, inflorescentia curvata, breviore, floribus manifeste odoratis, sepalis atrovinoso-purpureis, petalis flavidis, apice obtusis apiculatisque vel subacutis, antheris basi connatis et apice petalorum aequantibus differt.

Plant terrestrial, flowering 20-25 cm high. ***Leaves*** 10-15, distichously arranged or nearly so, coriaceous; ***sheaths*** distinctly broader than the blades, the older ones forming a subglobose base, 3.4- x 4-5 cm, suborbicular-ovate, dark castaneous, lepidote; ***blades*** sublinear-attenuate, distinctly U-canaliculate, suberect-arcuate, 25-40 cm long, ca. 1 cm wide near the base, green to reddish toward apex, opaque, inconspicuously white-lepidote abaxially with trichomes disposed along the intercostal zones and not obscuring the color of the blades, adaxially glabrescent toward the apex, distinctly nerved on both sides, apex long acuminate-caudate, pungent, margins glabrous, sparsely

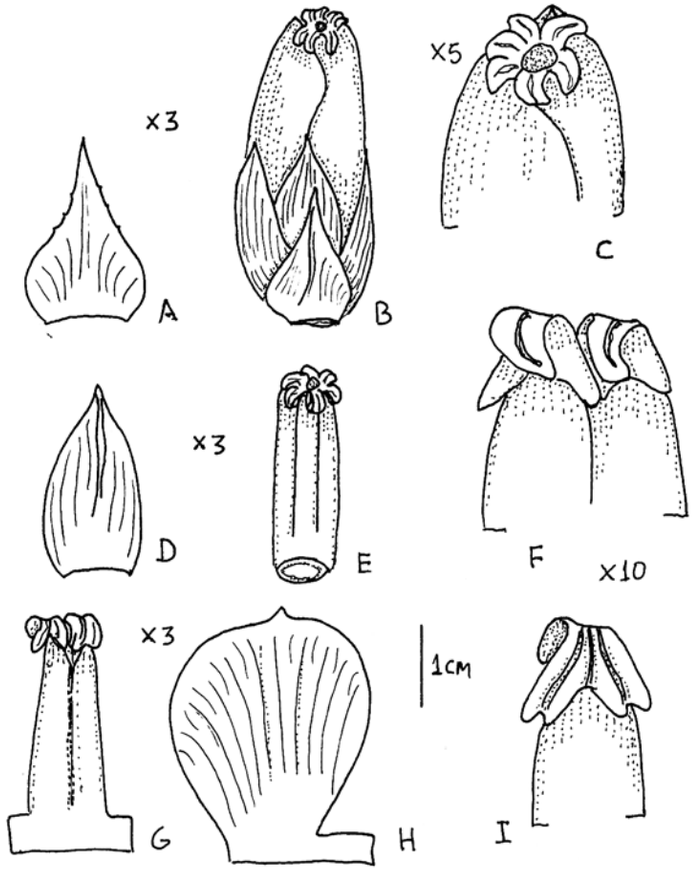

Figure 5. *Dyckia mirandiana* Leme & Z. Miranda: a) floral bract; b) flower; c) distal portion of the stamens; d) sepal; e) position of the filaments and anthers at anthesis; f) back view of the anthers at anthesis; g) filaments and anthers at anthesis; h) petals; i) front view of the anther Drawing by E. Leme.

spinose, spines 0.5-1 mm long, ca. 15 mm apart from each other, uncinate, retrorse to antrorse, castaneous, glabrous. ***Scape*** lateral, erect except for the curved apex, ca. 8 cm long, 0.4-0.5 cm in diameter, glabrous, sulcate, dark purplish-wine to blackish; ***scape bracts*** erect, dark purplish wine, distinctly nerved, bearing a central protruded longitudinal nerve but not at all carinate, sparsely to densely white-lepidote toward the apex, narrowly triangular, long acuminate-caudate, 12-18 x 6-8 mm, exceeding to equaling the internodes, margins microscopically and densely denticulate. ***Inflorescence*** strongly curved, ca. 6.5 cm long, laxly (at base) to subdensely (at apex) flowered, rachis straight, margins angular, dark purplish-wine to blackish, glabrous, 2-2.5 mm in diameter; ***floral bracts*** subtriangular, acuminate, bearing a protruded central nerve but not at all carinate, nerved, dark purplish-wine, sparsely white-lepidote, membranaceous, 7-10 x 5-6 mm, suberect with the flowers, exceeding (basal ones) to slightly shorter than the sepals, margins inconspicuously denticulate to entire. ***Flowers*** ca. 9 in number, ca. 12 mm long with extended petals, suberect anthesis, producing a strong sweet

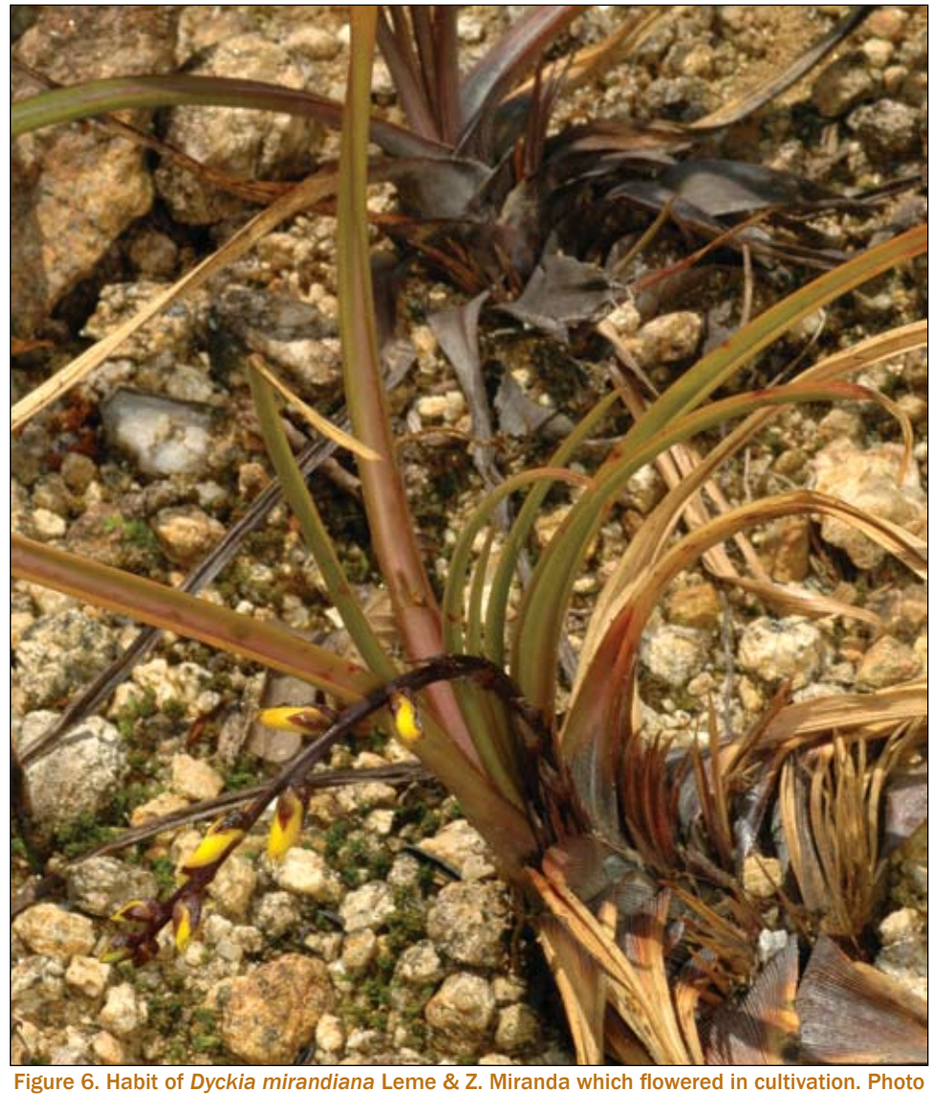

Figure 6. Habit of *Dyckia mirandiana* Leme & Z. Miranda which flowered in cultivation. Photo by E. Leme

fragrance, pedicels inconspicuous, stout, ca. 1.5 mm long, ca. 3 mm in diameter at apex; ***sepals*** symmetric, acuminate, convex, ecarinate but bearing a protruded central nerve mainly toward the apex, 6-6.5 x 3.5-4 mm, dark purplish-wine, glabrous, entire, bearing a protruded central nerve toward the apex but not at all carinate; ***petals*** symmetric, broadly obovate-spatulate from a narrower base, apex obtuse and apiculate to subacute, connate at base for ca. 1.5 mm in a common tube with the filaments, ca. 10 x 7.5mm, ecarinate, yellow, erect anthesis and forming a tubular corolla ca. 3 mm in diameter at apex; ***stamens*** about equaling the petals but distinctly exposed at the apex of the corolla at anthesis; ***filaments*** complanate, yellow, connate at base for 1.5-3 mm and free above, but arranged closely together and forming a cylindrical tube ca. 8 mm

long; ***anthers*** narrowly subtriangular, ca. 2 mm long, base distinctly sagittate, apex acute, strongly recurved toward the apex, fixed at base, adnate to each other at base and free toward the apex, forming a stellate structure well visible at the apex of corolla, ca. 2.5 mm in diameter, bearing a central entrance-hole ca. 0.5 mm in diameter; ***pistil*** ca. 6 mm long, completely hidden by the filaments tube; stigma conduplicate-spiral, blades subentire, yellow; style ca. 1 mm long, yellowish; ovary ovate, ca. 4 mm long, ca. 2 mm in diameter, greenish. ***Capsules*** unknown.

Paratype: Goiás, Alto Paraíso de Goiás, km 196 road GO 118, toward Teresina de Goiás, 13°55'41.4"S 47°25'59.4"W, 1,473 m elev., *Z. J. G. Miranda s. n.*. (CEN).

This new species can be distinguished from all known taxa due to an unusual combination of morphological features, like the distichous arranged leaves, leaf blades distinctly nerved on both sides with margins sparsely spinose, inflorescence curved and short, flowers strongly fragrant, sepals acuminate and dark purplish-wine, petals yellow with an obtuse and apiculate to subacute apex, forming a tubular corolla, and by the anthers basaly connate and equaling the petals.

The distichous leaf arrangement of *Dyckia mirandiana* resembles the rosette structure of *D. estevesii* Rauh (*D. mirandiana* never forms large clumps whereas *D. estevesii* does). However, because of completely distinct flower morphologies, these two species are not closely related. Conversly, whilst the leaf rosettes of D. mirandiana and D. horridula are not alike, these two species do have some common floristic characters such as the strong sweet fragrance and the yellow petals. Also, their filaments form a tubular structure, despite their being completely connate in *D. horridula*, that has a campanulate corolla, but only connate at base in *D. mirandiana* that shows in contrast a tubular corolla. Finally, they share the anthers basally connate to each other, forming a stellate structure in a top view, and bearing a small central entrance-hole to the internal chamber formed by the filaments, which hides the female organs. That stellate structure formed by the anthers obstructs almost completely the entrance of the tubular corolla of *D. mirandiana* and is well visible above it.

Dyckia mirandiana was found growing terrestrially, as a heliophyte, on an almost flat or slightly inclined terrain, with the sub-globose basal portion of the plants completely sunk in sandy soil accumulated among quartzitic outcrops in Campos Rupestres vegetation. The specimens were observed growing isolated or in small groups of about five or more individuals, with populations severely affected by the annual fires. In field conditions, the strong sweet fragrance produced by its flowers was more intensively perceived between 10:00 to 12:00 am.

The name chosen for this new species honors the bromeliad collector and writer Antonio Miranda from the University of Brasília, DF, who is an enthusiast of the bromeliad study and conservation in the Cerrado ecosystem of the Brazilian Central Plateau.

Figure 7. Habit of the fire-resistent *Dyckia mirandiana* Leme & Z. Miranda at the type locality. Photo by Z. Miranda.

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PLANT POTS AND COLLATERAL ISSUES

Herb Plever. Photographs by the author.

There is a lot that can be said about what pot you should choose for a particular bromeliad. Indoor growers resolved the simplest issue of plastic versus clay pots a long time ago in favor of plastic pots. That decision was based on the fact that clay is porous so the mix dries out quickly and needs to be watered much more often than the same mix in a clay pot. Also, early on, clay pots were more expensive; now, plastic pots are also costly to buy, even when you buy in bulk.

Thus we have used plastic pots for every kind of bromeliad that we grow. I have a large assortment of different sizes of plastic pots, ranging from 3" to 6" for both azalea and standard types of pots. These sizes refer to the diameter of a round pot. I also have bought square pots (when the price was right) and their size is measured by of the hypotenuse of two sides. We use azalea pots for most plants, because their height is only slightly less than their diameters so they are more stable. For instance the diameter of the base of a 4"pot is 3f" while its height is 3¾".

Bromeliad people around the world use many different types of mix. A good mix needs to provide aeration for the roots, be well-draining so it stays damp but not wet, won't pack down after frequent watering and have an acidic pH. I have experimented with many mixes, and right now I'm using straight shredded cedar bark and will continue its use until I find problems with it.

Experience has taught us that there are differences in the cultural needs of different bromeliads, even those within the same genus. We have learned to be careful about making and acting on generalizations, and that we need to closely observe each plant that we grow to get an idea of the best size pots to use. Things get complicated when we have to decide on what is the best sized pot for a particular species or cultivar.

Figure 1. *Pitcairnia tabuliformis*

For instance, if you grow *Pitcairnia tabuliformis* in an azalea pot you will find that its roots will quickly grow out of the drain holes for at a considerable length, searching for water. That species is a C3 metabolism water guzzler, and it needs a standard height pot instead of the azalea type to accommodate those long roots. Even with a standard pot, this plant is happier when I wick water the mix so it is always damp (so long as I remember to fill the reservoir).

However, a small pup of this species will not be able to suck up much water when it is first potted, especially if it has few or no roots. If the plant is started in a 4" standard pot which is 4" tall, the mix may remain too wet and this may promote rotting. To avoid this problem I start small pups of *Pitcairnia tabuliformis* in 3½" azalea pots and then repot to a 4" standard pot when the roots come out of the bottom holes. Or, I might try a 4" standard pot at the start, but I won't use a wick and will be sparing in watering the mix for 2 or 3 months.

Figure 2. *Nidularium innocentii* var. *lineatum.*

Another plant that needs to stay wet is *Nidularium innocentii* var. *lineatum.* It grows either terrestrially or epiphytically on the floor of Brazilian forests, and I have found that if its medium or leaf axils are permitted to dry out you will see dry, brown leaf tips and margins very quickly. This means it has to be watered more often or, if you are wick watering you have to check the reservoirs more often. A water guzzler will suck the water out of a reservoir very quickly, and for N. *innocentii* v. *lineatum* this means you have to check the reservoirs at least every week.

Most of our members tend to grow their plants (even quite large bromeliads) in small to very small pots of a 3" to 3½ inch diameter. Their feeling is that small pots contain the roots and thus restrain plant size. Depending on the plant, however, there is an additional downside to this approach other than as applied to water guzzlers. First of all, a well rooted plant will dry out quickly in very small pot even when grown in a water retentive mix . Some people prefer to let the mix dry out before watering; still you will have to water frequently for a medium or large plant in a small pot. With a decent sized indoor collection watering then becomes a chore when you have to hand-water your plants.

Then there is the question of the size of the inflorescence. I believe that a stronger root system will make for a more robust inflorescence, which will not be produced by an undersized pot. The answer to these questions can only be found from trial and error testing for each species and cultivar. I feel there should be an esthetic proportion between the size of the pot and the size of the plant. A large plant grown in a 3½" pot

Figure 3. Six foot bedroom window plant unit in Herb's bedroom.

looks strange to me. It is also unstable and will likely topple over unless you double pot it by putting it into an azalea pot which has a larger base.

I appreciate the miniature guzmanias and small vrieseas we have bought; they are growing compactly and well in 3½" and 4" pots. For small plants such as small cryptanthus I do use 3" to 3½" pots. I grow larger crypts such as *Cryptanthus* 'Strawberries Flambe' or *C.* 'Elaine' in 4½" azalea pots, but that is because I can't find 5" shallow, plastic bulb pans. These would be more suitable since crypt roots spread horizontally and don't grow down very deeply.

Unlike cryptanthus, *Pitcairnia tabuliformis* and *Nidularium innocentii* var. *lineatum* tend to grow their roots downward. I usually start the latter in a 4½" azalea pot and may transfer it to a 5" pot if looks like it might be pot-bound. You can tell if it needs repotting when many roots extend far out of the drain holes at the bottom of the pot. I grow most of my plants in 4" pots; large guzmanias go in 4½" pots and may get transferred to 5" pots if they become pot-bound.

Because I have a 6 foot plant unit in front of two wide, south facing windows in my bedroom, I have succumbed to temptation and dared to grow some very large plants such as *Aechmea fendleri*, *A. spectabilis*, *A.* 'Blue Tango, *Portea petropolitana* var. *extensa* and x *Vriecantarea* 'Inferno' (John Arden's cross of *Vriesea ensiformis* x *Alcantarea regina*). These wind up in 5½" pots and, often, in 6" pots. In a smaller pot, they will topple over when

they are mature even if double potted. I can grow these giants because the top of the unit is 28" high and I can safely raise them even higher, so their wide-spreading leaves are above my head when I walk by. When they get too big I force bloom with ethylene pills.

Plastic pots have become costly unless bought in bulk. Years ago we could buy a box of 4½" 250 plastic pots for about 5 cents apiece. Now the same size pot would cost 25 to 30 cents apiece, and the walls of the pots are half as thick as they used to be. I save my old pots so that I can recycle them. I soak them in a mix of detergent and bleach, for about 30 minutes and then scrub them clean for re-use.

Reprinted with thanks from *Bromeliana* 46(1). Jan. 2009. www.nybromeliadsociety.org

Figure 4. Azaelea pot (left) and standard plastic pot (right).

Misnamed Bromeliads #22 *Vriesea psittacina* var. *decolor.*[1]

Harry Luther

Figure 1 *Vriesea psittacina* at Selby Gardens.

Figure 2. *Vriesea "psittacina* var. *decolor*."

Vriesea psittacina (Hooker) Lindley is one of the more important ancestors of commercial Vriesea hybrids, and by the 1970's it had become very rare, if not extinct, in USA horticulture. It is, along with *V. carinata*, one of the most colorful and easily grown species. The illustrated specimen of typical *V. psittacina* flowering in the research collection at the Marie Selby Botanical Gardens was collected in S.E.Brazil twenty years ago by Georgia and Cecil Waggoner.

A more modest specimen labelled "*Vriesea psittacina* variety *decolor*" was brought in from Paraguay by Al Mussel last year. It would appear that this one is not the same species as *Vriesea psittacina* (Hooker), and they are certainly not of equal ornamental value.

1 Mulford B. Foster Bromeliad Identification Centre, Marie Selby Botanical Gardens, Sarasota, FL 34236, USA

Bromeliad Clone Preservation Project

A project initiated by the Bromeliad Society of South Florida.

The BSSF has adopted the establisment of a project, still in the planning and development stages, aimed at identifying and preserving valuable older clones of species and cultivar bromeliads that are in danger of being lost in cultivation. - The following outline was exerpted from the original proposal by Nat DeLeon, Alan Herdon and Karl Green - Ed.

"...Some of the old clones have undoubtedly disappeared, but bromeliads are a remarkably hardy group of plants, and many of the older plants may still exist in the off corners of small (or large) collections. As time passes, identification of these clones becomes harder as labels are lost ... and memories fade. There is also a slow but steady loss of plants in even the best maintained collections. Natural disasters (windstorms and floods in particular) can lead to catastrophic losses in both plants and the labels attached to the plants. However, the most serious risk of wholesale loss in older collections occur when the owners die, move or become too ill to care for their plants.

In some cases it is important to have these older clones in hand. For instance, I have not found plants comparable to the plants we used to call *Neoregelia ampullaceae* [var] *ampullacea* and *Neoregelia ampullacea tigrina*. Without the plants, I cannot even guess how they relate to the *Neoregelia ampullacea* complex as understood today.

Local Bromeliad Societies will play a crucial role...

We propose a project to preserve these old bromeliad clones. The project will focus on providing information on what clones are available and who is growing them. Specific goals include developing a database of the different bromeliad clones in cultivation, create a list of individuals growing each clone, and provide a framework for trading and selling these clones among interested growers. Clones most in danger of being lost in cultivation will be identified in the database.

The database will ultimately include all identifiable bromeliad clones, old or new. Clones will be identified by comparison to old photos and descriptions whenever possible. Older growers, such as Nat DeLeon, will also be pressed into service to help with the identification of these plants. The initial priority will be identification of older clones, since these are most likely to have dwindled in cultivation. Local Bromeliad Societies will play a crucial role in this project. Many desirable clones are probably waiting to be found in older collections where labels have been mixed and lost over the years. Knowledgeable local society members will be needed to ferret out these plants and establish their true identities. Local societies will also need to keep track of the individual growers in the database so all interested persons can be notified when a collection rich in desirable older clones is about to be dispersed.

Finally, local Bromeliad Societies could help preserve the more important clones by including them in their plant distribution programs.

Membership would be open to anyone

The general database should be open to all interested parties. Small commercial growers who would be willing to grow a clone that sells five to ten plants a year might find the database provides the necessary market, Collectors might find the database provides a way to exchange duplicates for money or other plants. There should also be a membership network of people most interested in growing these plants. The primary aim is to have each clone established in more than one collection to guard against loss.

Membership would be open to anyone willing to follow a few rules. Members would have to follow strict guidelines for labelling plants and ensuring labels are not lost. The central database would include a unique identifier for each clone that could be used in labelling so individual growers would not have to maintain the complete record associated with the clone. All members would agree to provide a minimum number of free offsets (perhaps 5) yearly for the benefit of the project (other offsets may be traded or sold for the benefit of the member). Finally, in the event of a natural disaster befalling one member, other members would be expected to help re-stock the collection of the affected member.

Benefits to members would include a ready source of information on all clones in the database and a directory of potential sources for desired plants. Members would also receive advance notice when another members collection (or a significant part thereof) becomes available. Finally, members could expect assistance in recovering their collections from disasters.

Where to Find Them

The following plants, illustrated in our last few issues, are available from Michaels Bromeliads (see their ad. on page 83):

Alcantarea imperialis, Aechmea recurvata, A. weilbachii, A. chantinii 'Samurai,' crypyanthus beuckeri, Tillandsia fasciculata, Neoregelia concentrica, Neo. 'Small Wonder,' Neo. 'Yang'

Michaels ship worldwide - tell them you are a BSI member and they will give you 10% discount on the above plants.

Tillandsia lotteae in Cultivation

Andrew Flower, BSI Editor

Figure 1. *Tillandsia lotteae* AB5095.

Figure 2. *Tillandsia lotteae* AB390.

Growing bromeliads from seed, tillandsia in particular, is my main horticultural. interest. When species come into flower in my collection, the first priority is to set species seed. Unfortunately, very few tillandsia species will self-pollinate if you have only one plant, or offsets that originated from the same plant (i.e., clones). Sometimes, it is not even possible to obtain seed by cross-pollinating seedlings that have come from the same seed parent (i.e., cohorts).

Virtually the only solution I have found to this problem is to find same species plants from different natural populations. *Tillandsia lotteae* is a nice example of a highly ornamental bromeliad that I tried to self-pollinate for more than 10 years with no success. Then, in 1994, I managed to obtain a second *T. lotteae* via. Tropiflora nursery in the US. Unbelievably, in each of the next 13 years one or the other of my *T. lotteae* flowered, but never both in the same year! Finally both flowered in the summer of 2008 (photos above - note clone ID numbers) and both plants have several seed pods.

Tillandsia lotteae has been a tough one - most of the species will have different clones flowering some time apart, but within the 6 months which is about the upper range I can store pollen for. That reminds me of the one time I got pollen on a normally self-sterile clone. It flowered one December, I stored pollen in case it was needed for a hybrid cross, then the same plant flowered again on a new inflorescence the following April, and accepted pollen I had stored from its previous flowering.

Catch the Fun . . . . July 26 – August 1, 2010

19th World Bromeliad Conference

Hosted by BSI & GNOBS

Astor Crowne Plaza Hotel
New Orleans, LA USA

For Conference Schedule and Registration Information visit our website: GNOBromeliads.com

For Hotel reservations contact the Astor Crowne Plaza at (504) - 962-0500 or visit www.astorneworleans.com.

World Bromeliad Conference 2010

Preliminary Schedule – Subject to Change

Monday, July 26th, 2010	
All Day	Hotel check in, rooms available
Tuesday, July 27th, 2010	
9:00AM - 3:00PM	Registration
9:00AM - 5:00PM	BSI Board Meeting
9:00AM - 5:00PM	Setup: Displays & Exhibits
12:00PM - 1:00PM	BSI Board Luncheon
1:00PM - 5:00PM	Optional Tours
6:30AM - 8:00PM	Meet & Greet / Cash Bar / Light Appetizers
Wednesday, July 28th , 2010	
9:00AM – 3:00PM	Registration
9:00AM - 5:00PM	Setup: Show & Sale
11:00AM - 4:00PM	Registration of Show Plants
2:00PM	Welcome to the Big Easy, Conference Official Opening
3:00PM - 5:00PM	Seminar
5:00PM - 6:30PM	International Attendees Reception
7:00PM - 10:00PM	Optional City Night Tours
Thursday, July 29th, 2010	SHOW DAY
8:30AM - 9:00PM	Judges & Clerks Continental Breakfast
9:00AM – 3:00PM	Registration
9:00AM – 5:00PM	Judging of Show
9:00AM - 12:00Noon	Seminars
12:00PM - 1:00PM	Judges & Clerks Buffet Luncheon
12:30PM - 1:30PM	Registrant Buffet Luncheon
1:00PM - 5:00PM	Optional Tours
5:00PM - 6:30PM	Cash Bar
6:00PM - 9:00PM	Show & Sale Opens to Registrants Only
Friday, July 30th, 2010	
9:00AM – 3:00PM	Registration
9:00AM - 5:00PM	Show & Sales Area Open to Public
9:00AM – 12:00 Noon	Seminars
1:00PM - 5:00PM	Workshops
6:00PM - 10:00PM	Cash Bar
6:00PM - 7:30PM	Optional Buffet
7:30PM - 10:00PM	Rare Plant Auction
Saturday, July 31st, 2010	
9:00AM - 5:00PM	Show & Sales Area Open to Public
9:00AM – 12:00Noon	Seminars
1:00PM - 5:00PM	Home Tours – Registrants Only
6:00PM - 7:00PM	Cash Bar
7:00PM	Banquet
Sunday, Aug 1st, 2010	
9:00AM - 3:00PM	Show & Sales Area Open to Public
9:00AM - 12:00Noon	Optional Tours
1:00PM - 3:00PM	Packing Room Open
3:00PM	Break Down of Show & Sales Area

Two New BSI Affiliates in 2008

Martha Goode, Affiliated Societies Chair.

We are happy to say that two societies became affiliated in 2008, The Austin Bromeliad Society from Texas and The Gainesville Bromeliad Society from Florida. Ron and Carolyn Schoeneau sent us the following article about the history of the Gainesville Society.

THE GAINESVILLE BROMELIAD SOCIETY

The Jacksonville Bromeliad Society (JBS) was founded in 1976 or 1977 by Kay and Lionel Carter. At the beginning, the society met on a weekday night in a classroom at Landon High School in Jacksonville. In 1977, Ron Schoenau gave a talk at this Society meeting and both Ron and Carolyn became members at that time. Carolyn served as its treasurer for many years.

In the 1980's, JBS had a few hard-working members like Tinker Musleh and Nelda Schwartz who led the group to hold three judged shows each year in the Palatka Mall, Normandy Mall and Orange Park Mall. In 1984 , JBS hosted the State Show at the Orange Park Mall. At that time, the State Show moved from society to society around the state before it was determined that a 3-day judged show as an annual event did not work and the Extravaganza was born.

Tinker and Nelda left their jobs at the University of Florida Library and moved out of state, leaving the society without organizers for all those shows. In lieu of a show, the Gainesville Bromeliad Society (GBS) participates in the Kanapa Botanical Gardens Spring and Fall garden festivals. Some other names from the original JBS membership are: Pat and Nick Ciccarello and Nick's mother, Dala Grinnell, Matt Encinosa, Kyle Brown and Larry Key and his wife, Jan.

Over the years, more and more Gainesville people joined the society as fewer Jacksonville people remained members. The "center of gravity" moved slowly to the Southwest. The JBS meetings began to be held in Gainesville. After a few years, only two or three members from Jacksonville remained; a vote was taken and the name was changed to the Jacksonville/Gainesville Bromeliad Society. A few years later, the name was changed to the Gainesville Bromeliad Society (GBS) but the exact date is not known. For several years, the GBS was held together by it's President, Al Muzzell.

In 2005, Al Muzzell suggested that the GBS select new officers. ByLaws were adopted in 2006 and officers were selected for 2007. Bob Neubaur was elected president for 2007 and other officers were elected. Bob Neubaur was formerly a president of the Bromeliad Society of Central Florida (BSCF) for two years and treasurer of the same society for four years (1992-1995). Since Bob Neubaur was elected as president the society has progressed as a self-governing society, following our bylaws, obtaining speakers and adding meeting activities such as silent auctions (suggested by member Peggy Mixon to raise money for the society) which have been quite successful. Member Show and Tell was instituted which provides in depth knowledge of bromeliads to the society.

The Society has been working for several months to become an affiliate of the Bromeliad Society International and was approved as an affiliate on October 9th.

Why become a BSI Affiliate?

The advantages of being an Affiliate of BSI are foremost that your society receives The BSI Journal six times a year for your library. Additional services are you have access to the seed fund, are able to use the member store and check out media library programs. Also, online services available to members are online use of back issues of the Journal, access to the binomial list and cultivar registry. The rate for an Affiliate has been reduced. The rate for a US member is $25 to receive the Journal by bulk mail. The rate is $30 for first class rate for US and for an International society member for a year. If your society is interested in becoming a member go to the bsi.org website to find out what the requirements are and contact the Affiliate Chairperson by email at affiliates@bsi.org or write to me at 826 Buckingham Ct., Crystal Lake, IL 60014-7601, USA. - *Martha Goode.*

Meet the New Cultivar Registrar, Geoff Lawn

Geoff resides in Perth, Western Australia and has grown bromeliads for over 40 years. His collection comprises 28 genera, specialising in Cryptanthus, Aechmeas, Billbergias, Neoregelias and variegates. He has been a BSI member continuously since 1976 and was appointed BSI Cultivar Registrar from January 1, 2009.

In 1979 Geoff was the founding President (and later life member) of the Bromeliad Society of W.A. Inc.,(now Western Australian Bromeliad Society Inc.) serving also as Editor, committee person and teacher of a local bromeliad judging school for 3 years. Other voluntary duties have been writing articles, guest speaking, W.A. Horticultural Council delegate (Society affiliate), supporting local Society Shows and also judging monthly meeting show-bench competitions. Currently Geoff is their librarian.

Geoff has attended 4 World Bromeliad Conferences and 6 Australian Conferences, lecturing at two of the latter. An avid bromeliad photographer, he has supplied several hundred photos for the fcbs.org/ Website. A range of Geoff's articles have been printed in BSA's Bromeletter, BSQ's Bromeliaceae Journal , Illawarra Bromeliad Society's Newsletter, BSI Journal and the Cryptanthus Society Journal. Geoff has been the Cryptanthus Society's International Director since 2002.

During his term as BSI Australian Director 2003-2005 Geoff took up a number of issues with the BSI Board. Subjects have included BSI affiliation pros and cons for Australian Bromeliad Societies; compiling Grace Goode's and Herb Plever's nominations for the BSI Wally Berg Award of Excellence; assisting the BSI Cultivar Registrar in identifying and/or registering unlisted cultivars within Australia and overseas; helping formulate the inaugural BSI Cultivar Registration Awards; drafting notes for BSI membership drive. Geoff compiled data on BSI Honorary Trustees and Wally Berg Award nominees and winners as BSI Website features. In June 2008, at WBC Cairns competitive show Geoff served as Classification/Entries Chairperson. BSI Honorary Trustee nominations by Geoff were successful for Herb Plever (2006) and Derek Butcher (2008).

Meet Two New 2009-2011 BSI Directors

Although Holly Mena, of La Mesa, California became involved with Cymbidium orchids and various other tropical plants 38 years ago, it was while working in nurseries around 1980 that she began her fascination with bromeliads. Initially simply a hobby, with the opening of an interior plant-scaping company in Bakersfield, California in 1982, she championed the innovative use of bromeliads for interior design. 3 years in Hawaii did not extinguish her love for bromeliads and for the later part of the 1990's, managed the California branch of a national indoor plant-scaping company. Today, Holly is the owner/operator of Greenery, Etc., in San Diego, which supplies hotels, offices and private companies with fresh changes of a variety of colorful patterned and flowering bromeliads as well as other plants.

In 2005 Holly joined the San Diego Bromeliad Society, where she has been serving on their Board of Directors, as the Librarian and as the Affiliates Chair to the BSI.

Gary Lund, from Largo Florida, has been in management for the better part of his business career (35 years). This experience helped him at the 2002 WBC in St. Petersburg Florida hosted by his home club, the Florida West Coast Bromeliad Society. He was responsible for managing the Sales' finances. He has served as Treasurer of his club for the past 11 years and has been a member of the BSI since 1998.

Gary was introduced to Bromeliads while looking for unusual plants to landscape his house which was undergoing remodeling. A local nursery associate suggested the FWCBS meeting as a way to get to know the "plant" family. He uses his plants to landscape his home, specializing in Aechmeas "for the bloom spike "and Neoregelias "for the leaf color". He also likes any plants that have large thorns on them. Not the best with Latin pronunciations, he feels comfortable growing many genera. He feels that he is a "hobbyist" at heart, but is always looking to improve his knowledge and growing skills.

EVENTS CALENDAR

Australia

October 25-26 2009, Bromeliad Society of NSW Spring Show, Concord

United States of America

August 1-2, 2009 South Bay Bromeliad Associates Bromeliad Show and Plant Sale. Rainforest Flora Nursery, 19121 Hawthorne Blvd., Torrance, CA. Sat. non-4:30pm, Sun 10:00am-4:30pm. Contact Bryan Chan (818) 366-1858 or bcbrome@aol.com

November 13-15, 2009. Florida Council of Bromeliad Societys Bromeliad Extravaganza, hosted by Bromeliad Society of Central Florida. Renaissance Orlando Hotel Airport, Orlando FL. Sales, Seminars, Tours, Banquet, Rare Plant Auction.

December 4-6, 2009. Caloosahatchee Bromeliad Socieyu Show & Sale. Terry Park, Fort Myers FL. Judged Show on Friday, Public Show & Sale Sat-Sun.

July 26 - August 1, 2010. BSI World Conference to be held at the Astor Crowne Plaza in New Orleans.

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.

Tillandsia species growing on a cliff face near the historic town of Cajamarca in Peru. In the background, eucalypts (introduced from Australia) that are becoming widespread throughout much of Peru. Unfortunately for the native epiphytes, these introduced tree species shed their bark. Photograph by Michael Romanowski.