



S.F.V.B.S.

SAN FERNANDO VALLEY BROMELIAD SOCIETY

OCTOBER 2018

P.O. Box 16561, Encino, CA 91416-6561

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Elected OFFICERS & Volunteers

Pres: **Bryan Chan & Carole Scott** V.P.: **John Martinez** Sec: **Leni Koska** Treas: **Mary Chan** Membership: **Joyce Schumann**
Advisors/Directors: **Steve Ball, Richard Kaz -fp, Mary K.,** Sunshine Chair: **Georgia Roiz** Refreshments: **vacant**
Web: **Mike Wisnev,** Editors: **Mike Wisnev & Mary K.,** Snail Mail: **Nancy P-Hapke** Instagram & Twitter & FB: **Felipe Delgado**

next meeting: **Saturday October 6, 2018 @ 10:00 am**

Sepulveda Garden Center 16633 Magnolia Blvd. Encino, California 91436

AGENDA

9:30 – SET UP & SOCIALIZE

10:00 - Door Prize drawing – one member who arrives before 10:00 gets a Bromeliad

10:05 - Welcome Visitors and New Members. Make announcements and Introduce Speaker

10:15 –Speaker – Sandy Chase

"The Sweet, The Foul, the Awesome Asclepiads."

Sandy is a long time cacti and succulent hobbyist. Her presentation will cover asclepiadaceae; a large group of succulent plants. Except for a few species of the genera Asclepias and Matelea, they are all confined to the Old World.

Sandy and her family moved to California when she was in elementary school. At an early age she developed a love for nature and joined the Los Angeles Cactus and Succulent Society in 1985. She is a dedicated member and has held every office in the club, resulting in an honorary life membership. If you have ever attended the LACSS Drought Tolerant Festival or the CSSA (national organization) shows, there is no doubt that you have seen her great educational displays. She is an avid grower and has a huge collection. And a few years ago she had the opportunity to visit Tanzania and other countries to see the plants she loves in habitat. In her spare time she has volunteered at the HBG for nearly 30 years. This is a presentation you're sure to enjoy, and won't want to miss. <>

11:15 - Refreshment Break and Show and Tell: Will the following members please provide refreshments this month: **those whose last name begins with in O, P, Q, R or S and anyone else who has a snack they would like to share.** If you can't contribute this month don't stay away.... just bring a snack next time you come.

Feed The Kitty

If you don't contribute to the refreshment table, please make a small donation to ([feed the kitty jar](#)) on the table; this helps fund the coffee breaks.

11:30 - Show and Tell is our educational part of the meeting – Members are encouraged to please **bring one or more plants.** You may not have a pristine plant but you certainly have one that needs a name or is sick and you have a question.

11:45 – Mini Auction: members can donate plants for auction, or can get 75% of proceeds, with the remainder to the Club

12:00 – Raffle: Please bring plants to donate and/or buy tickets. Almost everyone goes home with new treasures!

12:15 - Pick Up around your area

12:30 –/ Meeting is over—Drive safely <>

Message from your President

It has come to that time of year again where the club needs 2 separate volunteers to chair 2 temporary committees for 2018. One is for nomination of officers and the other is to coordinate our Annual Christmas party. Please call me at (818) 366-1858 if you would be interested in helping out.

I am also planning on holding a vote at the October meeting on the revised version of our club's bylaws.

Bryan Chan

Announcements

- **Gloria Friedman**, We are sorry to report that she recently passed away. Gloria was very active life member in SFVBS until a few years ago when she was too ill to attend monthly meetings. She was a great cook who always contributed refreshments. There was a castle in the Hollywood Hills often used for movies; her ex-husband and son lived there. On several occasions Gloria hosted our club meetings at the castle. Her son would give us the spooky tour.
- **Happy Belated September Birthdays** for **Jeanette Bond** and **Jenifer Culp**
- **Happy Birthdays** to **Mardy Graves Oct 5**, **Dave Bassani Oct 16**,
Nancy Pyne-Hapke Oct 27 and **Larry Farley**
- **Bylaws**. The directors and others have revised the SFVBS Bylaws to better describe the Club's practices and build in some flexibility for the future. There are 10 members who receive snail mail; if you want a copy let the president or secretary know in advance.
- **Oct 13th Bromeliad sale noon – 4:00**. **Yvette Fisher** wants to sell down her collection of plants. She has been growing and selling plants (primarily Tillandsias) for many years. They live near Culver City in the 90034 zip code, not far from the intersection of the 10 and 405 freeways. We are not posting her address in the newsletter since these are posted on line. Please contact Bryan bcbrome@aol.com 818-366-1858 if you are interested in the sale and then he will provide the address.
- **Participation Rewards System** – This is a reminder that you will be rewarded for participation. Bring a Show-N- Tell plant, raffle plants, and/or Refreshments and you will be rewarded with a Raffle ticket for each category. Each member, please bring one plant <>

Please Put These Dates on Your Calendar

Here is our 2018 Calendar. Rarely does our schedule change..... however, please review our website and email notices before making your plans for these dates. Your attendance is important to us

Saturday November 3, 2018	Nels Christianson
Saturday December 1, 2018	Holiday Party
Saturday January 5, 2019	STBA
Saturday February 2, 2019	STBA

STBA = Speaker To Be Announced

Speakers Let us know if you have any ideas for Speakers about Bromeliads or any similar topics? We are always looking for an interesting speaker. If you hear of someone, please notify John Martinez or Bryan Chan.

This article is contributed by Mike Wisnev

Bromeliads in Ecuador; courtesy of Jerry Raack.

Jerry Raack is a long-time bromeliad enthusiast (about 50 years!) who recently posted some great habitat photos he took in Ecuador. See <http://botu07.bio.uu.nl/Brom-L/>. He graciously allowed his pictures and emails to be used in the Newsletter. Thanks so much to Jerry for sharing these photos. Below is *Guzmania garciaensis*.

Jerry said: “Several observations. The plants at lower altitude were fully in anthesis, while those at the much cooler, wetter higher altitude were not yet in anthesis. Those at the higher elevation develop much more color on the foliage as can be seen in the pictures, and the inflorescence is covered with a thick mucous covering to protect the flowers during development. Not all plants at the higher altitude have foliage that is as red as the plant shown, but most had more color than at the lower altitude. Could be either or both the UV light difference or the colder temperatures that color them up. Those at high altitude were growing in much wetter conditions than those in the Condor.”





“Companion plants in the Condor were *Guzmania gracilior*, *Gregbrownia* (ex *Mezobromelia*) *rubrobracteata*, *Josemania asplundii* and a yet to be identified *Mezobromelia*. At the higher altitude, the companions were *Guzmania mosquerae*, a "form" of *Guzmania squarrosa*, 2 yet to be identified small *Guzmania*, and various hybrids. All those at high altitude were growing in deep moss which was quite swampy. A very beautiful species. I grow a form of *G. garciaensis* that I purchased from Karol Villena in Peru, but it does not color up for me anything like these. Could be my much warmer summer conditions, lower light levels, or the cultivar I have in my greenhouse. “

Taxonomic Tidbits: *Guzmania*, Part 1- its inflorescences and history and what is a genus?

By Mike Wisnev, SFVBS Editor (mwisnev@gmail.com) Photos by Wisnev unless noted.
San Fernando Valley Bromeliad Society Newsletter. October 2018.

The genus *Guzmania* is, at least for me, a rather daunting topic. I only have a few, and they don't seem to grow that well in our climate – it is too dry, or hot or cold. To make matters worse, the Bromeliad Taxon List listed 220 species as of April 9, 2018. Derek's key to the genus, prepared in 2003 and updating the key in Smith and Downs, is a whopping 18 pages with 162 keys.

If not for the inflorescence, many species look like *Vriesea*.

Here is a photo of *Guzmania musaica*, at Live Art.



There is a form without stripes, var. *concolor*. See 31(4) JBS.

According to the *Bromeliad Taxon List*, as of April 9, 2018, *Guzmania* is the sixth largest Bromeliad genus, after *Tillandsia* with 777, *Pitcairnia* with 408 (who knew that – Bob Wright ?), *Aechmea* with 251, *Vriesea* with 237 and *Puya* with 226. So you know, *Dyckia* has 172, *Neoregelia* has 123 and then it looks like no others even have 100. Butcher, D. & Gouda, E.J. (cont.updated) The New Bromeliad Taxon List. <http://taxonList.floraPix.nl>. University Botanic Gardens, Utrecht (accessed: April 9, 2018). I was shocked to see the next largest is *Navia*; I am pretty confident I had never seen one.



Guzmania lindenii shown in *Belgique Horticole* 3:21 (1883). While its leaves look much like *G. musaica* above, its inflorescence is much different.

G. bismarckii and *vittata* are other species with striped leaves like this. While *G. lindenii* and *bismarckii* grow in Peru, *G. musaica* is from Panama and Colombia while *G. vittata* is from Columbia and Brazil.

To continue the difficulties in approaching this genus, I didn't find a nice summary of the genus anywhere. You can often find a nice article about a genus fairly easily, but I

had no such luck here until the article was done! Other times I find a decent summary in an article about a few species. With well over 200 species, I wasn't about to start searching for one. Frankly, I am not even sure there are any botanists currently studying the genus. Jose Manzanares and Francisco Oliva-Esteve have written books on bromeliads in Ecuador and Venezuela, respectively, so these no doubt discuss *Guzmania* to some degree.



Here is one you even see in cultivation here: *G sanguinea*, on the show and tell table at our September 2015 meeting. I don't recall who brought it in.

I touched upon this genus back in 2015 with my now well-known and heavily cited article entitled the *Guzmania – Nidularium* complex. If you didn't read it, that complex doesn't exist – the title was a joke since the two genera are in different Bromeliad families. You can find the article on our website. *Guzmania*, which don't have spines on their leaves, belong to the *Tillandioideae* subfamily.

The most important information in that article said “How can you tell a *Guzmania* from a *Vriesea* or *Tillandsia*? They are distinguished in Derek’s key as having “Petal bases conglutinated in a tube, equaling the sepals or, rarely, the petals entirely included in the sepals.” Conglutinated basically means glued together. In contrast, *Tillandsia* and *Vriesea* have “Petal bases free or with very short tube exceeded by the sepals; flowers distichous in most species.” *Guzmania* almost always have polystichous flowers, which technically means they are arranged in a series of rows. I tend to think of the term more as spiraling around the inflorescence. Hopefully, the picture of *G. musaica* above gives you a better sense of the meaning of polystichous.

I asked some members on an internet forum how you could tell *G. musaica* it wasn’t a *Vriesea* without a flower. I got some good responses – “*Guz musaica* usually has many fewer leaves than a *Vriesea* .. it usually pups well and on long stolons , a dead giveaway that it is not a foliage *Vriesea*”



Another member of the forum said “*Guzmania* normally have red lines running lengthwise along the underside of the leaves.”

I checked out the *G. musaica* leaves to see if the underside had these red longitudinal lines, and lo and behold, they did. This particular species has much darker and thicker lines running horizontally across the leaves like many *Vriesea*.

According to Wikipedia, *Guzmania* “are mainly stemless, evergreen, epiphytic perennials native to Florida, the West Indies, southern Mexico, Central America, and northern and western South America. They are found at altitudes of up to 3,500 m (11,483 ft) in the Andean rainforests. ... *Guzmanias* require warm temperatures and relatively high humidity.” Another article describes

Guzmania as having naked petals (that is, no appendages) and ecarinate (not keeled) sepals.

The genus is one of the earlier bromeliad genera described. Along with *Aechmea*, it was first described in 1802 by Ruiz & Pavon in honor of Anastasio Guzman, a Spanish pharmacist and naturalist. Ruiz & Pavon collected over 3000 plants on their expeditions. It has a huge range concentrated in north and north western S. America through Central America into the Caribbean.



Figure 16. *Guzmania loraxiana* habit.

Jason Grant

G loraxiana, photos by Jason Grant. 51(3) JBS 126 (2001). This species was described by Jason Grant in 2001.

It grows in Panama. At one of its locations, Grant found 34 other bromeliad species within 15 km., including six other *Guzmania* and about 15 *Werauhia*.



Figure 17. *Guzmania loraxiana*. Closeup of inflorescence.

Jason Grant

Unable to find a longer article, I turned to another source. As I have mentioned, Smith and Downs published a huge three part monograph on Bromeliads in the 1970's. The Monograph is exceedingly technical, and generally consists of a botanical description of the genus, followed by all the species. Given its unbelievable length (2142 pages!), it is hardly surprising that this is not the first time they wrote about Bromeliads.

Less well known than the Monograph, Smith's Studies in the Bromeliaceae ("Studies"), published in 1977, consists of 18 different papers he did from 1930 – 1954. Compared to the Monograph, the Studies are pathetically short, only 550 pages, and and sometimes have additional information that doesn't appear in the Monograph. I bought the book and almost never looked at it, so I figured this would be an opportunity to take a look.

The first study was part of a series to update the *Tillandsioideae* family. About 85 pages in length, *Guzmania* occupied a mere two pages – Smith said there are about 80 species, and described only four of them.



Fig. 9.
Part of the *Guzmania undulatobracteata* inflorescence (in cultivation).



Fig. 10.
Guzmania undulatobracteata spike with one open flower.

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G undulatobracteata. Photos by Werner Rauh. Prof. Rauh found this species without flowers in Peru and Ecuador in 1971. He described it as a *Tillandsia* since it had a distichous inflorescence. A pup he collected bloomed 19 years later and he realized it was a *Guzmania*.

It was the first *Guzmania* found with distichous flowers and necessitated a change in the description of the genus. It grows in Ecuador and Peru.

There seem to be many species with a compound inflorescence, red/orange bracts and yellow flowers. *G plicatifolia* (Costa Rica and Peru) and *testudinis* (Ecuador to Columbia) are two more. I wonder how different they all are.

The Studies did in fact have information on *Guzmanias*, a lot of it being historical in nature. The third study (1932) focused on the bromeliads in Peru. This study listed

some 80 *Guzmanias*, their source publication and a “provisional” key. There was also historical information which shows briefly how the genus evolved.

Smith basically followed Mez’s earlier 1896 monograph, excluding the subgenus *Thecophyllum* which had been raised by Mez to genus level. He rejected the more recent work of Harms in 1936 that broke off three genera *Caraguata* (distinguished by the outline of the spike), *Massangea* (distinguished by petaloid and fused sepals) and *Schlumbergera* (having a compound inflorescence). It appears many species had been described in more than one of these genera. Smith didn’t think these distinctions were worthy of generic status, and treated them all as *Guzmania*.



Photo by Bob Wands for Selby Gardens
Guzmania fusispica now known as *G. osyana*
photo from J. Brom. Soc. 35:258. 1985

If nothing else, this information shows the variety of differences among plants in the genus. *G. musaica*, shown above, has a simple (non-branched) inflorescence (and was once considered a *Massangea* and *Caraguata*). Compare its shape to that of *G. osyana*, to left, once considered a *Caraguata*, and *G. lindenii*, shown earlier, once considered a *Schlumbergera* due to its compound inflorescence.

I had thought Harms described these other genera, but found a 1955 BSJ article that said Lindley did so. The name *Caraguata* was used by Indians for bromeliads, and Mez discarded in 1896. Apparently, Harms still liked it in 1936. Mulford Foster wrote another article that on how to tell if a bromeliad was a *Guzmania*. It is discussed at the end of this article.

Smith stated that *Guzmania* consists of the members of the *Tillandsioideae* family “with fused or agglutinated naked petals, polystichous-ranked spikes or racemes, and either non-petaloid sepals or else rosulate leaves.” Smith, L.B., Studies in the Bromeliaceae I-XVIII at 123. (As noted above, at least one species was later found with distichous leaves.) Smith also noted the last distinction excludes the rather weak *Sodiroa* genus which might also need to be discarded.

Given the many differently shaped inflorescences, it is hardly surprising that early botanists put them in different genera. However, the most recent DNA study on the subfamily Tillandsioideae found it was monophyletic. This means that all 13 of *Guzmania* species sampled in the study fell on one branch and no other non-*Guzmania* fell on that branch. Obviously, a larger sample might find some problems.

Buried under the listing of *G dussii* in Smith’s third study is more information about the now departed *Thecophyllum* genus. These species were once treated as a subgenus of *Guzmania* based on their “extremely abbreviated secondary axes.” In 1903, Mez made it a genus noting they had free petals bearing scales. Smith suggests that Mez thought those plants with abbreviated secondary axes all had free petals with scales, but Mez only mentioned the petal structure of one species. Smith also noted that later examinations might find that others don’t have free petals, as was the case for *G dussii*.



G dussii, once a *Thecophyllum*.
Photo by Jeff Kent. 51(3) JBS 118
(2001). Kent found this specimen
on Dominica, an island in the
eastern Caribbean, at about 2000 ft
high in the cloud forests. Kent
noted that most species seemed to
be self-pollinated which ensured a
stable population. However, *G
dusseii* has a long flower suitable
for hummingbirds.

Interestingly, Mez didn't move this species to *Guzmania* in his 1934-5 monograph. Mez kept the genus in that monograph, distinguishing it from *Vriesea* which also has petal scales. The key tells the difference, but is in Latin that translated to gibberish with Google translate.

What makes up a taxonomic unit? These earlier genera raise the question - which features are important for a genus, or subgenus or species? I wrote about this topic in the March 2014 Newsletter in an article called "What is a genus anyway?" The short answer may be that there is no answer. At a very simple and traditional level, a genus is a group of plants which share certain botanical features. Over time, the importance of various features has become more or less important.



Guzmania monostachia alba.

Photo by Maikel Canizares Morera. 54(4) J.B.S. 162 (2004). The normal form has red bracts. There is also a variegated form first found in Florida, and later in Cuba.

Guzmania tricolor, the type plant for *Guzmania*, has been referred to *Guzmania monostachia*. The original illustration is at the end of this article.

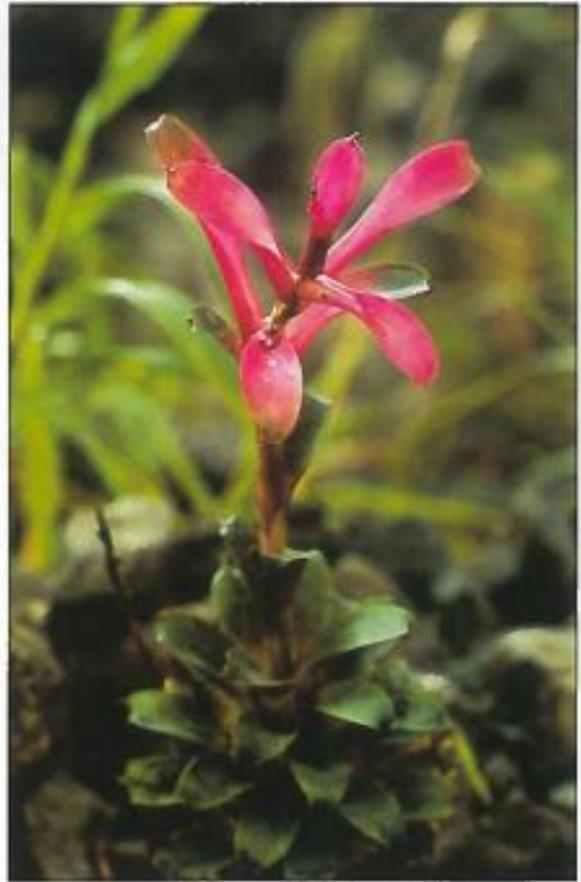
It seems safe to say that the more features that correlate for one group vis a vis another one makes it easier to conclude they are different genera. For example, let's make believe that all Argentinean *Dyckia* have a short simple inflorescence whose flowers have connate sepals and yellow petals, and that all Brazilian ones have a long compound inflorescence whose flowers have free sepals and orange petals. It would be hard to argue, absent DNA evidence, that these were not valid subgenera or even different genera.



Guzmania victoriae see J Brom Soc 41(1): 1. 1991

Photo by Werner Rauh. Rauh says *G. victoriae* from Peru has “a distichous arrangement of red-yellow floral bracts, often with a transition to a spirostichous arrangement.” 41(1) JBS 20 (1991). This species “seems to be a link between all the other polystichous-flowered *Guzmania* species and the distichous-flowered *G. undulato-bracteata*.” *Id* at 20.

In the real world, plants often don't categorize so easily. There are all sorts of combinations that probably exist. At least in the bromeliad world, it seems rather uncommon when a large number of individual characters align to distinguish various



G. kraenzliniana, photo by Betty Girko. 46(5) JBS 196 (1996). This species was first found in Columbia, and described as a *Guzmania* by Wittmack, then moved to *Thecophyllum* by Mez in 1903 and then back to *Guzmania*. Mazanares later found the species in Ecuador on the road from Lita to Alto Tambo. Many other species also grow in this area, including *G sanguinea* shown above.

groups, especially as the number of species in the group gets larger. As a result, taxonomic units are often expressed based a few pretty consistent differences, but with some modest exceptions. Sometimes a genus has no one unique feature, but a combination of features that is different from other genera.



G. besseae. Photo by Andrew Flower. 57(2) JBS cover (2007). Described by Luther in 1981, this species grows in both Bolivia and Ecuador.

The shape of this inflorescence is much more like a *Nidularium* than the ones shown above. *G. nidularioides* is another species that looks somewhat like a *Nidularium*.

There are a variety of problems with defining groups by plant characteristics, some of which are noted below. Since different genera are defined by different botanists, there may not be much consistency by different botanists. While the observations of the features are fairly objective, the determination of the breakdown of the features into taxonomic units is inherently subjective. Even the overall approach in a monograph is somewhat subjective. Brown and Leme stated “Baker (1889) weighted inflorescence characteristics heavily, Mez (1934) utilized numerous floral features, but placed great importance on pollen type, and Smith & Downs (1979) place significance on petal appendages, secondarily stressing inflorescence characters.” *Nidularium*, Bromeliad of the Atlantic Forest, p240.

Even individual authors may not be consistent, especially since herbarium specimens may not be available. When Smith and Pittendrigh decided to eliminate the *Thecophyllum* genus, they started out by saying

It has long been evident that no author has been consistent or logical in delimiting the genera of the subfamily Tillandsioideae of the Bromeliaceae. Virtually all useful phylogenetic characters are limited to the petals, stamens, and pistil, yet available material is so frequently inadequate in these parts, that there is a tremendous temptation to base genera on other characters. The assumption has been that certain habitual characters are correlated with floral ones. This is true in a single instance, the absence of spines on the leaves of the Tillandsioideae. All other correlations in the subfamily are incomplete to begin with, as in the case of the distichous arrangement of flowers that partially characterizes *Tillandsia* and *Vriesia*, or else they have broken down with the discovery of additional species.

Realignments in the Bromeliaceae subfamily *Tillandsioideae*. Journ. Wash. Acad. 43: 401-404. 1953



G. rauhiana, photo by Wands. JBS 104 (1988)

These problems are well illustrated by *Guzmania*. As noted above, Harms described *Caraguata* (distinguished by the outline of the spike), *Massangea* (distinguished by petaloid and fused sepals) and *Schlumbergera* (having a compound inflorescence). However, Smith said “it is felt” that Harms’ genera were based “on characters that are not of sufficient value to be generic.” A little bit later, Smith created a new genus, *Mezobromelia*, largely if not entirely distinguished from *Guzmania* based on a single feature - the existence of two appendages on the flower petals.

At least on a superficial basis, this is perplexing. One genus is created based on a single difference, the existence of petal appendages. Yet three other genera are ignored since

since the one or two differences in each are not that important. I suspect that Smith was merely being consistent compared to other genera. As noted many times, *Tillandsia* and *Vriesea* are largely separated on the basis of petal appendages. If that distinction is valid there, it seems logical to apply it to *Guzmania*. And many genera include some species with simple inflorescence and some with compound ones (and some species can have either). So it hardly seems consistent to break out some *Guzmania* on that basis.

I wondered if any *Mezobromelia* and *Guzmania* grew sympatrically (in the same place). I stumbled across this picture and got my answer. Here are *Guzmania wittmackii*, *Guzmania andreana* and *Mezobromelia capituligera* in habitat near Altaqure Columbia (photo by Jeff Kent) 31(6) JBS 257 (1981).



Of course, this begs the question or many of them. Why are petal appendages so important? Well, after decades of thinking they are of critical (and absolute) importance, many botanists de-emphasized their importance. But now they are again recognized as an important feature, though not as much as traditionally.

DNA studies have changed much of this analysis. They increasingly redefine generic boundaries and the species within them based on the results of phylogenetic sampling. Botanists then look for distinguishing morphological differences between the different resulting genera. Sometimes the DNA results, which are based on small portions of the DNA, just don't mesh with any apparent features, and the researchers conclude more work is needed. Other times botanists find the groups have common features, but different than those used before. This is a much more objective approach, but sometimes leads to rather unsatisfactory results for the hobbyists when the morphological distinctions are technical, like stigma type.



Guzmania lingulata var *cardinalis*.

L' Illustration horticole, vol 27: t 374 (1871). Image from the Biodiversity Heritage Library. Digitized by [Missouri Botanical Gardens, Peter Raven Library www.biodiversitylibrary.org] This particular plant was found in Columbia.

This species has a very wide range, and appears to be one of the few, if only, species in this genus that grows in eastern Brazil (in the state of Bahia.) Thus, its range extends into that of the Nidularioid complex species; Leme says *Canistrum guzmanioides* grows in the same area of Bahia as this *Guzmania*, as do *Neoregelia crispata*, *Nidularium procerum*, *Hohenbergia correia-araujo* and some *Vriesea*. Almost all other *Guzmania* species grow well to the west or north.

There have been a number of varieties of this species, based on the size of the leaves, whether they are striped, and the color of the outer involucral bracts (red, pink or scarlett). *Var. cardinalis*, shown below, is known for its spreading bright scarlet bracts. As you can see in the illustration below, it was first considered a *Caraguata*, and some authors later treated it as a different species.

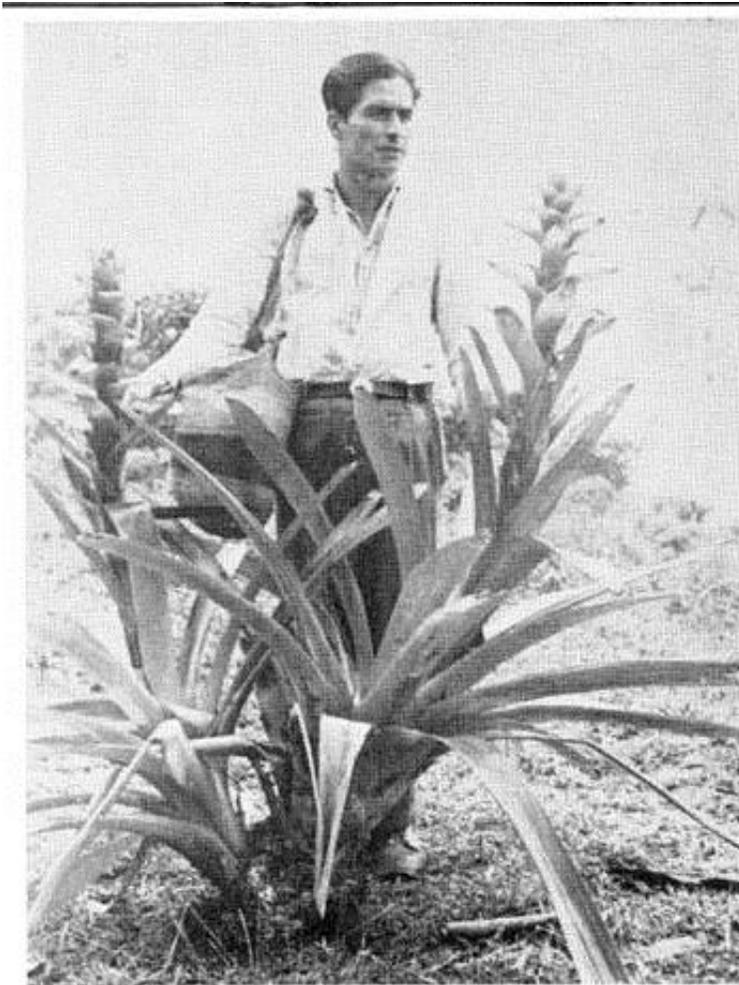
Below are some *Guzmania* and *Vriesea* cultivars from Kent's Bromeliads at a meeting of the La Ballona club. Some other genera may be represented as well.



As noted earlier, Mulford Foster wrote a guide for the laymen on how to recognize a *Guzmania*. 5(5) BSB 74 (1955). (At that time the Bromeliad Society produced the Bulletin not the Journal as it is known today.) That particular edition was devoted to *Guzmania* – all 14 pages. Many of these

features were the same as those of other Tillandsioideae subfamily – no spines on the leaves and feathery seeds. Others were more specific: (1) the leaves generally have red or brown longitudinal lines, (2) the flowers are in more than two rows (no longer always true as noted above), (3) the sepals are fused (not true according to Smith & Downs), and (4) the petals are joined together but not fused, and do not have petal appendages. He also noted the flowers are usually white or yellow and the bracts are very colorful – yellow, green, white or red-orange. Foster stated that “I have endeavored to simplify and synthesize to a minimum, those characteristics essential to the determination of a *Guzmania* without which your

observations can have no valid frame of reference.”



Id at 75.

Cover of 5(5) BSB 1955, showing *Guzmania danielli*. Foster said they had to carry this plant over a mile out of the jungle (after getting it from a tree) to get a good photograph. I presume that is him in the photo. The photographer may have been his wife, Racine.

Below is the original illustration of *G. tricolor*, the type species. It is now referred to *G. monostachia*. Ruiz Lopez, H., Pavon, J.A., Flora Peruviana, et Chilensis, Plates 153-325, vol. 2: p. 38, t. 261 (1798-1802)

http://plantillustrations.org/illustration.php?id_illustration=187182&SID=0&mobile=1&code_category_taxon=1&size=0

