



S.F.V.B.S.

SAN FERNANDO VALLEY BROMELIAD SOCIETY
NOVEMBER 2018

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

sfvbromeliad.homestead.com

sanfernandovalleybs@groups.facebook.com

Twitter is: *sfvbromsociety*

Instagram is: *sfvbromeliadsociety*

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 November 3, 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 – Nels Christiansen

11:15 - Refreshment Break and Show and Tell:

Will the following members please provide refreshments this month: **those whose last name ends in T, U, V or W and anyone else who has a snack they would like to share 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 comes home with new treasures!

12:15 - Pick Up around your area

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

Nels Christiansen



Nels is a long time member of SFVBS as well as the LaBallona Valley Bromeliad Society in Culver City.

(continued on page 2)

He is a native of Merced, California. He was educated at UC Santa Barbara, Georgetown University, UCLA and the Federal University of Minas Gerais where he studied Brazilian literature through a Rotary Foundation scholarship. He retired in 2012 after a 37-year career in hospital administration and international relations at the UCLA Medical Center. Nels is a board member of the Cactus and Succulent Society of America, a published poet and a board member of California Poets in the Schools, an organization which brings poetry composition workshops to 25,000 K-12 students statewide. Nels has been a member of the Cactus and Succulent Society of America (CSSA) and of the Sunset Succulent Society in Marina del Rey since 1984. He has participated in CSSA trips to Brazil, Argentina, Peru, Oaxaca, northeastern Mexico and the Canary Islands. He is a potter and sells planter pots at his club meetings. Nels is the president of the Westchester Begonia Society, a member of the Culver City Gesneriad Society, Bromeliad Society international. He is a weekly volunteer at the Desert Collections at the Huntington Botanical Gardens. <>

Taking a look back at last month..... We had a nice turn out with good participation. The program by Sandy Chase was very good and so was the show-n-tell with many interesting plants. The new By Laws were voted on and approved. Plans were made for the Holiday Party; sign up with Mary Chan.

Announcements

- **No November Birthdays??**
- **Participation Rewards System** – This is a reminder that you will be rewarded for participation. Bring a Show-N- Tell plant, raffle plants, and 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	<i>Nels Christiansen</i>
Saturday December 1, 2018	<i>Holiday Party</i>
Saturday January 5, 2019	<i>STBA</i>
Saturday February 2, 2019	<i>STBA</i>

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. We have had some interesting speakers this last year and it is never too early to start planning for 2019. 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 Bryan Chan. <>

This section is open for Member contributions of photos or articles....

Mike Wisnev submitted the following article

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 this Newsletter. Thanks so much to Jerry for sharing these photos.

The plants below have been tentatively identified on the website as *Tillandsia kalbreyeri*, a good species distinct from *T. fendleri*.



Jerry says “Locality - Ecuador, Azuay Province ..., Elevation 2650 meters, Growing both terrestrially and epiphytically. This is a tall plant to about 175 to 185 cm tall with the inflorescence. Note the indumentum on the underside of the rather waxy leaves. A brilliant plant when in bloom. When in the trees, the inflorescence stood well above the trees and was easily visible.”



Taxonomic Tidbits: *Canistrum*, *Wittrockia* *Edmundoa* and more - Part 3 (*Wittrockia*)

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

This is now the third article that was supposed to talk about *Wittrockia leopardinum*, but the prior ones were high-jacked by *Canistrum* and *Edmundoa*. This Part 3 finally accomplishes the task. Elton Leme is the expert on all three genera, which are discussed at length in his 1997 book entitled *Canistrum – Bromeliads of the Atlantic Forest* (“*Canistrum* Book”). A detailed key is in his 1998 book, entitled *Canistropsis – Bromeliads of the Atlantic Forest* (“*Canistropsis* Book”).

To refresh your memories, *Canistrum* have an inflorescence topped by a cup-like structure formed by its upper scape bracts and primary bracts. Its sepals are asymmetrical with a wing-like structure. In contrast, the bracts of *Wittrockia* and *Edmundoa* don't form a cup and the sepals are symmetric (or subsymmetrical). *Edmundoa* has an inflorescence that has persistent wool after flowering while *Wittrockia* doesn't.

History of *Wittrockia*. *Wittrockia* has a convoluted history that is discussed at length in the *Canistrum* Book and an article by Leme and Luther. See Leme and Luther, Transferring *Canistrum flavipetalum* Wand. to *Wittrockia*. 60(3) JBS 103-114. 2010 (“2010 JBS Article”). Named after a Swedish botanist, the genus was described by Lindman in 1891 with a single species - *W. superba*. Lindman considered it close to *Nidularium*, distinguishing it based on its petal appendages, which are absent in *Nidularium*.

The genus was short-lived, however. In 1894, Mez created *Canistrum* subg. *Nidularioipsis* with one species (*C. amazonicum*, now considered a *Nidularium*); in an addendum appearing in the published work, he moved *W. superba* into it. In 1896, Mez then changed the name of this subgenus to subg. *Wittrockia* which was distinguished from other *Canistrum* by its connate petals.

Smith then unceremoniously made it a genus in 1945 by listing it in his key, distinguishing it from *Canistrum* based on its connate petals; both genera have petal appendages which distinguished them from Neos and *Nidularium* which didn't. A rather rigid application of these distinctions expanded the genus to a "chaotic conglomeration" of 12 species by 1997.¹

Wittrockia leopardinam at Live Art. This species is discussed later.



Current status. In his *Canistrum* Book, Leme redefined the genus. Instead of relying on the rigid application of a few factors, he considered a variety of morphological factors to redefine the genus: the "isolated individual use of some diagnostic elements (e.g., nidular inflorescence, flower pedicels, petal concrescence, petal appendages) was assigned a relative value, both in weight and importance." Id. at 104. His goal was to limit the genus to those species with an affinity to *W. superba*, the type species.

As a consequence of these decision, Leme reduced the genus from 12 to 5 species. Actually, he moved 10 of them to *Nidularium*, *Neoregelia* or

Aechmea - only *W. superba* and *spiralipetala* were retained. He also added three more: *W. tenuisepala* (which had been a *Nidularium*) and *W. gigantea* and

¹By 1955, Smith and others had expanded *Wittrockia* to six species (*W. superba*, *minuta*, *amazonica*, *smithii*, *campos-portoi* and *azurea*), and Smith added *W. bragarum* in 1969. Leme later added six more – *paradoxa*, *spiralipetala*, *leucophoea*, *ibiticpocensis*, *corallinae* and *echinata*. *W. smithii* and *minuta* were then synonymized.

cyathiformis, both of which had been considered *Canistrum*. After 1997, Leme added two more species, bringing the current number to seven.

Comparison with related genera. *Wittrockia* has affinities with *Edmundoa*, *Neoregelia* and *Canistropsis* (which in 1997 was *Nidularium* subg. *Canistropsis*) – all generally have subsymmetrical, non-pungent sepals, and free (or basally connate) petals often with petal appendages. However, it is distinguished by a variety of features. Like *Edmundoa* (but not Neos and *Canistropsis*), they are “medium- to large-sized plants that propagate by basal shoots that sometimes elongate.” *Canistrum* Book at 60. As compared to *Edmundoa*, they have fairly large spines, larger flowers and don’t have wooly inflorescences, or if they do, it is less dense and persistent.

***Wittrockia superba*.**

I was surprised to find a number of clumps of *W. superba* at the HBG in the Jungle Garden. This very large species almost always has red tipped leaves like those shown here. I have never seen any of them bloom, although it blooms low in the rosette so I might have missed it. It has a large range from Santa Catarina to Rio de Janeiro. Like many species in this genus, it grows in the trees, on the ground and on rocks.



The 2010 JBS Article also reviewed a variety of features, which are briefly summarized. *Wittrockia* leaves resemble those of *Edmundoa* with thick walled cells and vascular bundles. In contrast, *Canistrum* and *Aechmea* leaves have more spongy cells. As contrasted to *Canistrum*, *Wittrockia* have longer more symmetric sepals without a keel, longer and differently shaped petals, and white, orange-yellow or red fruits (as compared to purple), as well as a different form of pollen. Geographically, *Wittrockia* and *Edmundoa* are found in southeast Brazil, while *Canistrum* grow in northeast Brazil.



Figure 5- *Wittrockia tenuisepala* (type descendant), the smaller species of the genus.

Wittrockia tenuisepala, a smaller species in the genus. Photo by Leme. 60(3) JBS 109 (2010).

Named for the slender apices of its sepals, Leme first described this species in 1990 as a *Nidularium* based on its connate petals without appendages. When he revised the *Wittrockia* genus in 1997, he moved it to this genus and noted its similarity to *W. superba* and *cyathiforme*.

In many ways, this species is like *W. superba*, including its subcorymbose inflorescence, connate sepals, and adnate filaments. However, it is smaller, and has a more involucre cup-like inflorescence— this is formed by the erect long and wide overlapping primary bracts that extend far above the flowers. In contrast, *W. superba* has narrower bracts that Leme says are neither cup-like nor involucre.

The species grows in one location in Minas Gerais and apparently does not pup much. Only one collection of it had been made as of 1997.

In the “Key to Genera and Subgenera of Nidularioids” in Leme’s *Canistropsis* Book, *Wittrockia* shows up twice. The genera with generally symmetric petals

are first broken into those with a simple (or pseudosimple) inflorescence, which includes most *Neoregelia* and some *Wittrockia*. Most Neos have shorter flowers. As to those with longer flowers, *Wittrockia* have shorter pedicels and other differences.²

Canistrum ingratum,

which Leme referred to *Wittrockia gigantea*. Its color seems a bit lighter than the few pictures I have seen of this species. This is also an old species, first described as a *Nidularium* in 1880. In some ways it resembles *W. superba* (spiny leaves and low inflorescence), but its umbellate inflorescence and free sepals and filaments are like *W. cyathiformis*.



² The key says "Flowers with pedicels less than 3 mm; apex of the sepals acuminate-caudate; antepetalous filaments almost completely adnate to the petals, the antesealous ones free above the common basal tube with the corolla; stigma globose, yellow; ovary 20-25 mm long. *Canistropsis* Book, p. 17.

Edmundoa, *Canistropsis* and the other *Wittrockia* all have a compound inflorescence that doesn't hold much water as compared to *Nidularium*, and also have sub-erect to spreading petals.)³ As to these three genera, *Edmundoa* has a thick inflorescence (8-17 cm diameter) that has persistent wool after flowering while *Wittrockia* and *Canistropsis* have thinner inflorescences without persistent wool. *Canistropsis* have slender stolons with short flowers, while *Wittrockia* have basal shoots or stout ones with longer flowers.⁴

Battle of the botanists. The most recently described member of the genus is *W flavipetala*. Photo by Leme. 60(3) JBS 103.

³ "Inflorescence neither impounding water nor forming deeply uniutriculate or multi-utriculate reservoirs (except when sub cylindrical); primary bracts exposing the sepals at anthesis; petals free or connate at base to 1/2 their length, apex acuminate to rounded, suberect to spreading at anthesis; **if** erect, then antepetalous filaments strongly plicate at middle. Id at 17.

⁴ "Plants propagating by basal shoots or stout stolons 1-2 cm in diameter; inflorescence less than 10 cm long; leaves coriaceous, or nearly so, coarsely spinose, spines 2-6 mm long; flowers 45-80 mm long; apex of the sepals often attenuate-caudate." Id at 17.



Figure 1 - Habit of *Wittrockia flavipetala* (Leme # 3824) that flowered in cultivation.

First found in 1992 by others, Leme also found it and included his specimen as an unpublished *Wittrockia* species in his key to the genus in 1997. He didn't describe it since he was advised Wanderley was doing so. Wanderley then described it as a *Canistrum* (named for its prominent yellow flowers) and didn't recognize Leme's new *Wittrockia* and *Edmundoa* genera. Two years later, Leme moved it to *Wittrockia* and criticized Wanderley's failure to recognize the new genera. With its stellate (starlike) inflorescence and reflexed bracts, *W. flavipetala* is similar to *W. cyathiformis*, pictured below, but has a shorter peduncle and light green bracts.

W cyathiformis. Photo by Leme. 60(3) JBS 104. First described as a *Tillandsia* in 1829, this species has a huge range that is more or less the same as the entire genus – from Santa Catarina to Bahia. Like *W superba*, it has leathery leaves with noticeable spines. Due to its flower parts, herbarium specimens have been confused with *W. gigantea*, but it has a much longer peduncle, a smaller inflorescence and various other differences, including petal color.

The peduncle is the tallest in the genus – over 1 ft. tall. Notice that the scape bracts are reflexed unlike the erect ones of other species in the genus. Five of the seven *Wittrockia* species are pictured in this article. *W spiralipetala*, named after its spiraled petals, is found only at the type locality in Rio de Janeiro. It has many affinities with Neos including well developed stolons, and Leme says it lies at the border of the two genera. It has green fairly short primary bracts, and yellow petals with violet tips.

The other species is *W. paulistana*, which is like a more delicate *W cyathiformis* with a smaller involucre. It grows in Sao Paulo.

Excluded Species. As noted earlier, when Leme revised this genus in 1997, he moved 10 of its then species to *Nidularium* and *Neoregelia*. These will probably be discussed in connection with those genera. The other two were moved to *Aechmea*.

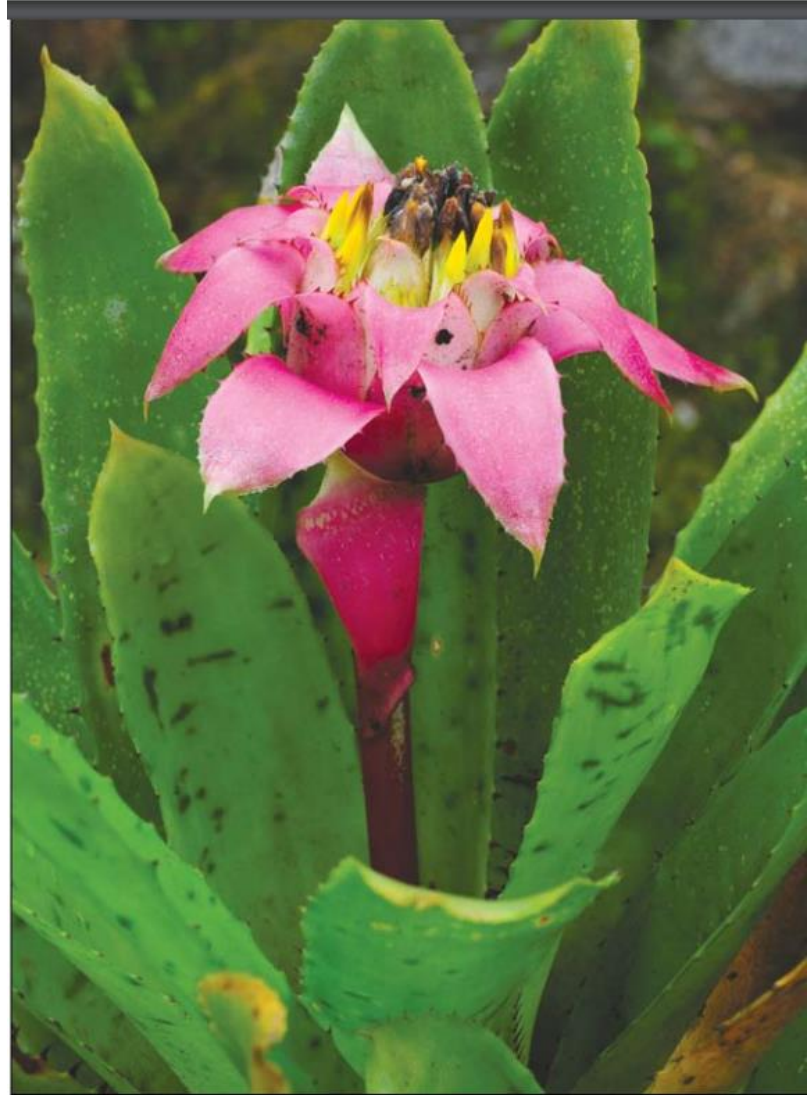


Figure 2 - Habit of *Wittrockia cyathiformis* (Leme # 6384).

A. echinata, shown below (courtesy of P. Tristram and Bromeliads in Australia, <http://www.bromeliad.org.au>) is one of these species.



The other is *A. paradoxa*. These two species (together with *A. mollis* and *A. weberi*) form a species complex in south Bahia. *A. paradoxa* was pictured in Part 2 of this series in connection with Leme's assertion that a complex of 4 *Canistrum* species in south Bahia may form a bridge between these south Bahia *Aechmea* species and *Canistrum* subg. *Canistrum*.

W. leopardinum. You might realize that *W. leopardinum* hasn't been addressed. It turns out there is some mystery here. Apparently, it hasn't been found in habitat in decades. Derek Butcher wrote an article about it in 2003 that appears in the Bromeliad Cultivar Register. To summarize, the plant started out as a *Canistrum* back in the 1880s. Somehow over the years, it was thought to be a hybrid, allegedly of *C. ingratum* (now *W gigantea*) and *Edmundoa lindenii* var *rosea*, the plant discussed in the previous Newsletter.

Below is *Wittrockia gigantea*. Photo by Terry Davis.
<http://www.bromeliad.org.au/pictures/Wittrockia/gigantea.htm>



Leme treats it as a synonym of *W gigantea*, though acknowledging “there is no way to verify its correct usage.” Canistrum Book at 71-2.

After finally seeing pictures of it in flower, Derek agrees it isn’t an *Edmundoa* hybrid as it has no wool in the inflorescence like *E lindenii* does. But there are a number of differences between the plant they had that flowered and the description of *W. gigantea*, including the size of the petals, the color of the sepals, differences in the shape and coloration of primary bracts and difference in the size, shape and spotting of the leaves. As a result, in his article noted above, Derek says “I believe that *C. leopardinum* is very close to *Wittrockia gigantea* and intend to treat this cultivar as a form of *W. gigantea* and not a hybrid.”

Here are two pictures of *Wittrockia* ‘Leopardinum’ cv. of *W gigantea* on the Bromeliad Cultivar Registry.



If you compare these with the earlier pictures of *W gigantea* above, you can see the obvious differences noted in Derek’s article, especially the color differences and the leaves being spotted.



W. gigantea has the widest inflorescence in the genus.

Recent Taxonomic Studies. While the various DNA studies discussed in previous parts of this complex all placed the sampled *Wittrockia* species in the Nidularioid complex, it doesn't seem to be a good genus. Two of them placed *W. cyathiforme* with *E lindenii*, and *W superba* fairly distant.⁵ A 2015 study had the three sampled *Wittrockia* species in different clades.⁶ One might argue this is not a complete surprising given the many differences among the species regarding sepals and inflorescence.

A 2017 morphological study did not resolve the *Wittrockia* species but did show that *Aechmea mollis*, *weberi* and *echinata* were grouped together.⁷

After finishing the article, the *W superba* at the HBG bloomed.

Despite a number of visits, I never saw the petals in full anthesis!



Taxonomic Tidbits –

⁵ De Oliveira F.M.C, R. Louzada, M. Wanderley and G. Melo-de-Pinna Morphoanatomical characters in the Nidularioid Complex (Bromeliaceae: Bromelioideae) from a phylogenetic perspective . *Flora* 239 (2018) 111-121.

Silvestro, D., G. Zizka, and K. Schulte. 2014. Disentangling the effects of key innovations on diversification of Bromelioideae (Bromeliaceae). *Evolution* 68: 163–175

⁶ Evans, T.M., R. Jabaily, A.P. de Faria, L.O.F. de Sousa, T. Wendt, and G.K. Brown. 2015. Phylogenetic Relationships in Bromeliaceae Subfamily Bromelioideae based on Chloroplast DNA Sequence Data. *Systematic Botany*, 40(1):116-128.

⁷ Santos-Silva, F., Venda, A.K., Hallbritter, H.H., Leme, E.. M.C., Mantovani, M., and Forzza, R.C. Nested in chaos: Insights on the relations of the 'Nidularioid Complex' and the evolutionary history of *Neoregelia*(Bromelioideae-Bromeliaceae). *Brittonia* 69 (8). 2017

Billbergia with whitish (maybe) petals; Summary of petal colors

By Mike Wisnev, SFVBS Editor (mwisnev@gmail.com)

San Fernando Valley Bromeliad Society Newsletter –November 2018

We have now discussed all but two members of subgenus *Billbergia*. What are the other two? Well, it seems safe that they don't have blue, purple, yellow, green or red petals. Frankly, that may not be true - I put the species into groups based on a quick look at the key and some pictures, and sometimes that look wasn't thorough enough to reveal all the facts. In any case, what's left – maybe orange? Black would be cool!



photo by Reginaldo Baião.

One of these two species was found fairly recently – *B kautskyana*. Described by Pereira in 1978, he says it “it differs from all other *Billbergias* in its white scape and primary bracts and in the entirely whitish sepals and petals.” *Bradea* 2: 275. 1978. But I didn't find one picture of this species that had petals I would call white. In fairness, Pereira says the bracts are white and the petals “whitish.” But either there are different colored petals for other clones of this species, or Pereira has a very broad view of what is “whitish.”



***Billbergia kautskyana*, photo by Reginaldo Baião.**

The bracts are fantastic, and certainly white. But those petals don't look very white to me! How did this species show up here? It is a pretty interesting species with its fairly large spines and white (or pink!) bracts. B. 'Domingo Martins,' a form of *B vittata*, grows in the same area. That would be quite a hybrid to see.

Interestingly I did find that Tropiflora sold the species in the past and described it as follows:

“This interesting and obscure species from Domingos Martins, Espirito Santo in Brazil has a more open than tubular shape. Superficially it resembles the species *B. sanderiana*. The plants are about 12 inches tall and wide with light green leaves mottled with white or pinkish blotching, abundant scurfing and large black spines. The inflorescence is pendant with pink bracts and large, light greenish-yellow flowers. There appears to be some variation in the amount of pink, with some clones being almost white.

Our plants originated as seedlings from the Bromeliad Identification Center at Selby Gardens a number of years ago. SEL 1993-0181.”

<http://newcart.tropiflora.com/product.cfm?product=31681&v=0.53246471964&W=980&H=1743#Middle>.

Let’s see if we have better luck with the last species, which is *Billbergia horrida*. Petal color often isn’t even mentioned in botanical descriptions, and rarely shows up in a key to the species. In Smith’s key, *B horrida* is in a group with a glabrous and erect inflorescence, a non-setiform sepal, and sessile flowers, along with *B amoena* and the hybrid *B buchholzii*. Smith’s key distinguishes *B horrida* by virtue of its “Inflorescence densely spicate with subspreading flowers in many rows; sepals 13-15 mm long,” as compared to “Inflorescence lax with divergent flowers in few rows, usually compound; sepals 20-30 mm long.”

Armed with that information alone, tell me which of the pictures below is *B horrida*?



The one on the left is *B horrida* (photo by Butcher), and *B amoena* (photo by Wisnev) is on the right. Based on the key above, pretty hard to tell which is which.

Smith says the petals are “dark blue at apex and elsewhere pale green to nearly white.” Well, the picture above by Derek seems to qualify as “whitish.” The petals have also been described as “strongly spatulate, white, totally green or green with 1/10 blue tip, strongly recurved.” Barros & Costa, for State of Rio de Janeiro, Acta bot. bras. 22(4): 1172-92. 2008.

In his 1979 monograph, Smith describes two varieties – var. *horrida* with green leaves, and var. *tigrina* with leaves purple brown. Apparently he only had one variety earlier.

Billbergia horrida, PAF 1604,
photos by D Butcher.



Like *Billbergia kautskyana*, the spines are pretty nice as well, but the scape bracts are awfully unimpressive. I haven't seen it anywhere – does anyone have it? So does the description match?

Foster said “This striking plant described by Baker as "Leaves brown, copiously banded with white on the back." ...In 1939 and 1940, while collecting in Brazil, we took both the green phase and the deep maroon-brown phase in Espirito Santo. I had always considered them distinct color varieties. In fact one would be inclined to pass by the green variety, as var. *tigrina* is so superior in every way.

We find that this *Bill. horrida* var. *tigrina* is quite a free bloomer and while the flowers are interesting they could hardly be called beautiful. Almost transparent green with a fleck of blue, they are fragrant at night which is possibly an unique attribute among the Billbergias.”

NOMENCLATURE CLARIFICATION No. 9
BILLBERGIA HORRIDA Regel var. *tigrina* Hort. by Mulford B. Foster in Brom Soc Bull 6: 77. 1956

Let's see what some other pictures show.



On the left is an illustration (22 La. Belg. Hort. 336 (1876)) showing white petals with blue tips. On the right is a scan of *Billbergia horrida tigrina* by Derek Butcher showing yellow green petals without any blue.

This species has a wide distribution, and is found in the states of Minas Gerais, Espírito Santo, Rio de Janeiro and Bahia. “The species is different from the others by having a robust tubular rosette, leaves with wrinkle in the base of the blades, scape glabrous and thick, scape bracts papyraceous, brown and involute, rachis glabrous, dense inflorescence, flowers actinomorphic white or greenish, blue blemishes reduced or absent in the sepals and petals, and petals recurved.” Barros & Costa, for State of Rio de Janeiro, Acta bot. bras. 22(4): 1172-92. 2008.

Summary of petal colors in subgenus *Billbergia*. Summarizing, a rough breakdown of the categories is below.

Five to seven species with green, yellow or green/yellow petals, plus five varieties or forms of others: *chlorantha*, *laxiflora*, *viridiflora*, *decipiens*, *castelensis*, *tweedieana* (maybe), *kautskyana* (maybe), *amoena* var *viridis*, *distachia* var *straussiana*, *lietzei* var *chlorantha*, *iridifolia* var *concolor*, and some forms of *minarum*.

Three species with green petals that are blue at the very tip: *amoena*, *elegans* and *distachia*.

Nine species with green extending beyond the sepals and blue for more than just the tip: *sanderiana*, *saundersii*, *lietzei*, *leptopoda*, *iridifolia*, *minarum*, *nana*, *X claudioi*, and *manarae*.

beyond the sepals that are blue for more than just the

Three species with blue around the margins: *nutans*, *fosteriana* and *macrocalyx*.

Five or six species with green at base, basically covered by sepals, and rest of petals all blue. *euphemiae*, *morelii*, *seidelii*, *pohliana*, *reichardtii* and *tweedeiana* (maybe).

Four species with blue/violet petals – *vittata*, *bradeana*, and *macracantha*, and *brasiliensis* (probably not in this subgenus), as well as the hybrid *B buchholzii*. However the base may be white or pale green on some these!

One red at the base with blue for the blade - *lymanii*

One almost all red, but blue/violet at tip - *pyramidalis*

One (or two) whitish, sometimes with blue tips – *horrida* and *kautskyana*.

As has been seen in the articles, many of these are variable, and shades can vary with growing conditions. Moreover, the color of the claw is often not noticed, so may differ from what is shown above.

If you're into animals....

 PLEASE SHARE 

Squirrels absolutely love pumpkins so don't chuck yours away after Halloween why not put them at the bottom of the garden or take them to your local woods or park? Imagine how many wild animals could be fed with the millions of pumpkins that are thrown away each year. Not just the squirrels but birds hedgehogs badgers and foxes all love pumpkins. Especially this time of year when there is less of an abundance of food for the wildlife.