S.F.V.B.S.

SAN FERNANDO VALLEY BROMELIAD SOCIETY

APRIL 2018

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

sfvbromeliad.homestead.com sanfernandovalleybs@groups.facebook.com

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, Mike Wisnev–fp, Mary K.,** Sunshine Chair: **Georgia Roiz**
Refreshments: **vacant** Web: **Mike Wisnev,** Editors: **Mike Wisnev & Mary K.,** Snail Mail: **Nancy P-Hapke**

next meeting: Saturday April 7, 2018 @ 10:00 am

Sepulveda Garden Center 16633 Magnolia Blvd. Encino, California 91316

AGENDA

9:30 – ***SET UP & SOCIALIZE***

10:00 - *Door Prize drawing* – one member who arrives before 10 am receives a Bromeliad

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

10:15 –*Speaker* – ***Cristy Brenner***

Subject: ***"Bromeliads of Eastern Brazil"***

Brazil is the largest country in South America and offers many different environments that support Bromeliads. Cristy will take us on a tour of Minas Gerais and the Bahia states where we will see Bromeliads from nineteen different genera. We will see the plateau regions of the semi-arid Caatinga and Cerrado regions, as well as the Atlantic coastal forest and the large granitic domes that support cliff-hanging Bromeliads.

Cristy is President of the Saddleback Valley Bromeliad Society in Mission Viejo. She has presented several talks at BSI conferences and is also a BSI Judge. As a recently retired Community College Geography professor, she has visited all of the continents, but in

(Continued)

recent years she has concentrated on regions with Bromeliads. In addition to Brazil Cristy has observed and photographed Bromeliads in Mexico, Guatemala, Honduras, Costa Rica, Trinidad, Tobago, Ecuador, Peru, Argentina and Venezuela.

Don't miss this program <>

11:15 - Refreshment Break and Show and Tell: Will the following members please provide refreshments this month: ***Joyce Schumann, Peter Speziale, Trina & Ethyl Toyama, Ray VanVeen, Mike & Ana Wisnev*** 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 a tip on growing it better. Now is the time to ask 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 <>

Taking a look back at last month…….. Many thanks to *Marquita Ellias* for her educational program explaining Botanical Names. Thanks to *Nancy* for introducing the club to Yvonne Salvio's "Gardening In LA" web site. The club can have free advertising for monthly meetings and shows; just need one person to step up to do the posting. http://www.gardeninginla.net/botanical-gardens-and-other-organizations-garden-events.html The Board of Directors met after the regular March meeting; items discussed were 501.c status, Liability Ins., Updating By-Laws and the upcoming June Show and Sale.

Announcements

- ***SFVBS Business*** *- at the end of the April meeting*
- ***Sign up for local Gardening info*** on plant clubs, shows, sales, gardening tips and more. Join the Gardening **in LA Mailing** list! To sign up to receive free monthly email announcements, email Yvonne Savio directly at GardeningInLA@gmail.com
- ***Happy April Birthday*** to *Chris Rogers* April 4th, *Ray Vanveen* April 12th and *Bryan Chan*.
- ***National Public Gardens Day*** is Friday before Mother's Day on May 11, 2018.
- ***Advertisement*** - Should SFVBS send a $60.00 add **in memory of Max Wurzel and Bob Friedman** to BSI?
- ***World Bromeliad Conference May 29 – June 3***

  Message from San Diego Bromeliad Society

  http://www.sandiegobromeliadsociety.org/world-conference.html

  *Hi fellow affiliates, hope many of you can join us at the **WBC 2018 in San Diego**! We have a lineup of wonderful speakers: Li Ping (China), Peter Waters (New Zealand), Jose Manzanares (Ecuador), Paul Isley (CA), Pam Hyatt (CA), Dennis Cathcart (FL.), Ivon Ramirez (Mexico).*

  We hope you can join us on Mission Bay in San Diego May 29-June 3. Even if you are unable to join us, please take out an ad in the program to aid BSI in this endeavor to offer excellent conferences. If each affiliate took out a 1/4 page ad for only $60 we would be well on our way to funding the conference and future conferences. It can be a very simple ad, such as:

  *"Wishing you well on the BSI **WBC** 2018 from the Bromeliad Society of _ _ _ _ _."*

  Or anyone can send an individual ad from a person or an "in memory of _ _ _ _ _ who loved bromeliads too."
- ***BSI Conference May 29 – June 3*** - The opportunity to attend a **BSI** conference this close to home doesn't happen often. If you really like bromeliads, want to learn more about them, see some of the best specimens being grown around the world and have an opportunity to purchase one or two new hybrids…… you don't want to pass up this event**.** ***A bus trip*** from Culver City to the BSI Conference is currently being organized for ***Saturday May 31***. If you are interested in the bus trip you may sign up now and pay later. Price and times have yet to be determined. When enough people have expressed interest and the price has been determined you will be contacted and can then pay or decline. Right now you need to hold a seat by emailing *Kwan, Phillip C. <PKwan@mednet.ucla.edu>*.
- ***Suddenly 65 –*** Nancy Pyne-Hapke is posting the club meeting on http://www.suddenly65.com/
- ***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 <>

NEED TO RENEW your 2018 membership dues?.....

Pay at the meeting to: Membership Chair – Joyce Schumann or Treasurer - Mary Chan
or Mail to: SFVBS membership, P.O. Box 16561 - Encino, CA 91416-6561
Yearly Membership **Dues - $10 for monthly e-mail** newsletters or **$15 for snail mail**

Watch Out for April Fool Jokes!

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 April 7, 2018	***Cristy Brenner - Bromeliads of Eastern Brazil***
Saturday May 5, 2018	***STBA***
Saturday & Sunday June 8 & 9	***SFVBS Bromeliad Show & Sale***
Saturday July 7, 2018	***STBA***
Saturday August 4, 2018	***STBA***
Saturday September 1, 2018	***STBA***
Saturday October 6, 2018	***STBA***
Saturday November 3, 2018	***STBA***
Saturday December 1, 2018	***Holiday Party***

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 **johnwm6425@gmail.com** **or** Bryan Chan **bcbrome@aol.com** <>

Member Photo: submitted by Cristy Brenner

Sincoraea albopicta (Orthothytum albopictum)

Photos from Ecuador – courtesy of Jerry Raack.

Jerry Raack is a long-time bromeliad enthusiast (about 50 years!) who recently emailed and posted some great habitat pictures from his trip to Ecuador. He tries to specialize in higher altitude cool growing species bromeliads with an emphasis on *Tillandsia* and *Guzmania*. He graciously agreed to allow his pictures to be used in the Newsletter.

While we grow a lot of *Tillandsia* here in southern California, with over 600 species it is not surprising that there are more we aren't familiar with than those we are. Jerry's pictures were not only great photographs, but also showed many species I had never heard of, let alone seen.

Jerry's email to the Brom-L group showed this stunning ***Tillandsia portilla***.

Jerry's email to the Brom-L group said "This is the first time I have seen *Tillandsia portillae* in flower. All other times, I have seen post-anthesis inflorescences which are orange to orange-red in color. When in anthesis, the inflorescence is a pretty bright yellow color, changing to orange and red-orange after anthesis."

In an email to me, he added "*Tillandsia portillae* prefers to grow epiphytically in areas which receive constant winds. *Racinaea euryelytra* and *Tillandsia ionochroma* are common companion bromeliads on the same trees. Found at an elevation of 2657 meters (8700 feet), this may not be the easiest of Tillandsias to grow unless you can keep your temperatures a bit lower (majority of time below 80 degrees) and your humidity at close to 50%."

It was only after I started writing this column that I checked the website for more of his pictures of this species. This picture of ***Tillandsia portillae*** might be even prettier.

Wonder how they grow ?

Finally, the *Tillandsia portillae* flowers are just as pretty.

Thanks very much to Jerry Raack for sharing these photos!
For those of you interested in more about this
email group and the associated website,
see http://botu07.bio.uu.nl/Brom-L/.

Taxonomic Tidbits –

Cryptanthus and related genera - Part 2

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

San Fernando Valley Bromeliad Society Newsletter –April 2018

Last month's article described the history and background of *Cryptanthus*, along with some contrasts to *Orthophytum*. It continued by noting Elton Leme and three other botanists broke up *Cryptanthus* and created three new genera. New circumscription of *Cryptanthus* and new Cryptanthoid genera and subgenera (Bromeliaceae: Bromelioideae) based on neglected morphological traits and molecular phylogeny. Leme, E., Heller, S., Zizka, G., and Halbritter, H. Phytotaxa 318 (1): 001–088 (2017) (the "Article").

The Article elevated *Hoplocryptanthus* to genus status (8 sp. including one former *Lapanthus* species) and recognized two other new genera called *Forzzaea (3 sp.) and Rokautskyia (14 sp.)*. (It isn't clear how the math works here – *Cryptanthus* started with 81 species, 24 were moved to the three new genera, yet 55 remain in *Cryptanthus*. What happened to the other two?)

This newsletter discusses the four genera and their differences from each other and *Orthophytum* and *Sincoraea* (which was previously broken out of *Orthophytum)*.

Morphology. Before getting to the new genera, below is a brief summary of the many morphological characteristics discussed in the Article as they apply to the various genera and subgenera. The Article has over 35 pages discussing these features along with numerous pictures. In general, *Cryptanthus* and the three new genera are supported by molecular data, a specific geographical range and various morphological features.

1. Most of the groups have a fairly distinct geographical range.
2. Most species are short and stemless. However, most of the groups (but not *Sincoraea, Forzzaea, Lapanthus* and *Orthophytum* subg *Clavanthus)* have some members with long or intermediate stems..
3. Vivipary seems to be limited to *Orthophytum* subg *Orthophytum*, and some *Rokautskyia* species.
4. Most species have a compound inflorescence. However, in most of the groups (but not *Rokautskyia or subg Clavanthus),* there are a few species with a simple or pseudosimple inflorescence.
5. In general, the *Cryptanthus*-related genera (and *Sincoraea*) have sessile corymbose (relatively flat) inflorescences. In contrast, most *Orthophytum* have a pedunculated spike like inflorescence. Some *Rokautskyia* species have longer inflorescences, and a handful of *Orthophytum* have sessile ones.
6. *Cryptanthus* usually have petals that form a short tube and then open, with petals usually 4-8 times longer than wide. Most other groups have petals 2.5 -5 times longer than wide. Most *Orthophytum* groups (and *Lapanthus* and *Sincoraea*) have flowers where the petals form a fairly long tube at the base and then open at the ends. *Orthophytum* subg. *Clavanthus* and some species in subg *Capixabanthus* have club-like flowers that don't open. Most species have white (to light greenish) flowers.

Lapanthus duartei.

Photo by Barthlott. 45(1) BSJ 48. This may be the only species in the Cryptanthoid complex with yellow-orange flowers.

This particular species had been described originally as *C. duartei* and *O. supthutii* and shows features of both *Orthophytum* and *Cryptanthus*. The other species has white flowers, like most members of the complex. They have some unique features described below.

7. Free or connate sepals and petals are fairly consistent within groups. All *Orthophytum* have free petals and all but one species (the subg. *Krenakanthus* species) have free sepals. All four *Cryptanthus* - like genera have connate sepals (except *F. micra*) and all but two (*F. micra* and the *Haplocryptanthus* species that had been considered a *Lapanthus*) have connate petals.

8. In general, the dried sepals remain attached to the shorter fruits, the exception being the *Cryptanthus* genus.

9. *Cryptanthus* and new genera don't have petal appendages, while *Orthophytum* (except for two species) do. *Orthophytum, Sincoraea and Lapanthus* have five different shapes of petal appendages, three of which exist only for one group (although members of that group might have a different shape). Two of the shapes are found in 3 or 4 groups. *Lapanthus* have a unique shape. Some of these forms are described in the Article for the first time.

10. Glandular trichomes along petal margins was a feature used to distinguish the fairly new *Lapanthus* genus. However, these trichomes also appear on a few *Orthophytum* and *Sincoraea* species and one *Haplocryptanthus* species that had been considered a *Lapanthus*.

Figure 6. Floral details of *Cryptanthus crassifolius* Leme.

Cryptanthus crassifolius.

Photo by Leme. 58(1) BSJ 17. Note the short tube at the base of the flower, and the petals being much longer than wide. This is characteristic of *Cryptanthus*, but not *Orthophytum or Lapanthus,* both of which have a longer tube and relatively shorter petals.

Though not really visible, the three petals are connate, (that is, joined at the base), and the six filaments are joined to the petals (adnate), like all *Cryptanthus*.

As might be expected by the look of the leaves, this species grows in rock outcrops in a fairly sunny location.

11. All groups have the same sulcate pollen type, thought there are differences regarding "shape, size, reticulum and sulcus peculiarities." Id at 52.
12. All bromeliads species have six stamens – 3 opposite the petals and 3 opposite the sepals. The genera vary as to whether they adnate (joined) to the petals and sepals. It appears that all *Orthophytum* and *Cryptanthus* related genera have adnate antepetalous filaments, except for *Lapanthus* and one *Haplocryptanthus* species that had been considered a *Lapanthus*.
13. Stigma type correlates very well with the different groups. There are seven different stigma types for these genera and subgenera, some described for the first time in this article. In general, all species in a group have the same type (however, four of the types are found in two or more groups). *Forzzaea* and *Orthophytum* subg *Orthocryptanthus* have species with different types.
14. Unlike most other Bromelioideae genera, the fruit of these groups is relatively dry, as opposed to having a sticky mucilaginous substance. The fruits of *Cryptanthus* are much larger than the other genera, and as noted earlier, the calyx (sepals) decay quickly for *Cryptanthus*.
15. There are numerous differences regarding the size (1 – 5mm long) and number of seeds (2 to 150 per fruit) for the various groups. Unlike many other bromeliad genera, there is no seed appendage for these groups. *Cryptanthus* have the largest seeds. In general, fewer seeds per fruit correlate with higher humidity, with *Cryptanthus*, *Forzzaea* and three *Orthophytum* species having the fewest, *Rokautskyia* and *Orthophytum* subg *Clavanthus* with an intermediate number and the other groups with more than 30 seed per fruit.

Figure 2. Flowering specimens of *Cryptanthus robsonianus*. Photo by Elton Leme.

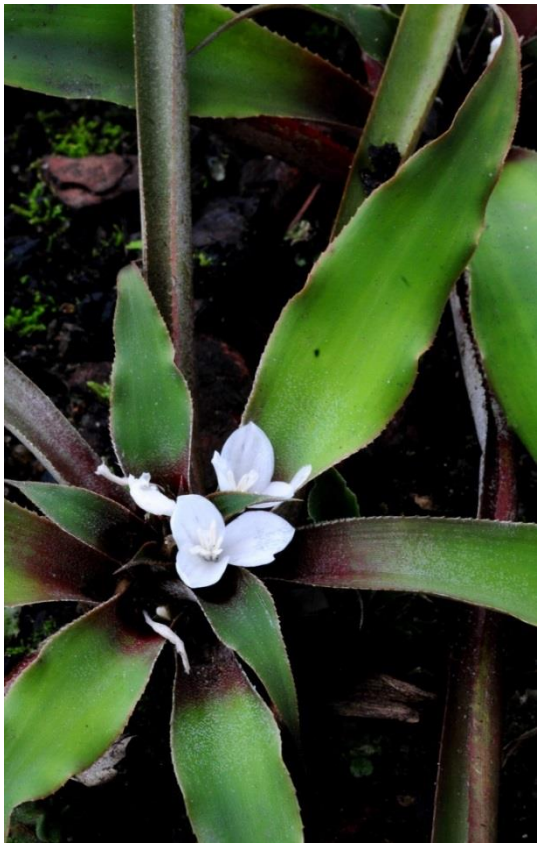
Cryptanthus robsonianus.

Photo by Leme. 64(3) JBS 150-155.

According to Leme, this species is very unique due to its relatively tall head of 20-30 staminate flowers, which is the largest such structure among *Cryptanthus*.

Its large and broad dark leaves are also uncommon. Like many *Cryptanthus*, but not some of the new genera, its leaves are undulating, and narrower at the base.

As might be expected by the lack of many visible trichomes on the soft looking leaves (contrast with the previous picture), it grows in humid and shady areas.



Rokautskyia (formerly Cryptanthus) aracruzensis.

Photo by Kollman.

Notice the much rounder flowers compared to *Cryptanthus*. They are also only 2-3 times longer than wide. This is characteristic of many species of the new genera.

This species has leaves that more leathery (coriaceous) at the base than the ends, and the outer leaves are often longer than the inner ones.

The red color at the base of the leaves is common for this species, without regard to whether it is flowering. This species grows about 20 km from the ocean.

Cryptanthus argyrophyllus

This may have been my favorite *Cryptanthus* - even though it never flowered (or appeared to grow). Sadly, I found the tag, and a nearby empty pot earlier this year! A squirrel? bird? Hopefully not one of our dogs.

The species was described by Leme in 2001 and named for its silvery color due to its heavy trichomes on both sides of the leaves. As can be seen, the actual leaves are bronze or green.

As shown in the table below, there are some pretty clear differences between these four *Cryptanthus* genera as opposed to *Orthophytum.* Unfortunately, they aren't too easy to see without some serious looking.

	Orthophytum	*Cryptanthus*, *Haplocryptanthus*, *Rokautskyia* and *Forzzaea*.	*Sincoraea*
Flower type	Subtubular or club-like (except the two tiny subgenera)	Open fan blade-like, with small tube	Subtubular or club-like
Sepals	Free (one species connate)	Connate (one species free)	Free
Petals	Free	Connate (two species free)	Free
Petal Appendages	4 various types, including a few w/ sacciform	none	Sacciform type
Stigma type	Simple dilated (except for three species). None of the other genera have this type.	Except for *Forzzaea*, one different type for each genus. No *Orthophytum* or *Sincoraea* have these 3 types	Simple erect (shared with *Forzzaea* and one *Orthophytum*)
Fragrant flowers	No, except the two tiny subgenera	Yes, except *Cryptanthus*	No
Inflorescence	Usually with peduncle	Sessile, except some *Rokautskyia*	Sessile

Revised *Cryptanthus* genus. *Cryptanthus,* as now revised, grow along the eastern coast of Brazil, from Rio de Janeiro in the south to Rio Grande do Norte in the north. [This is much the same range as *Orthophytum* except that the latter usually grow more inland.] They generally grow at sea level to 400 m altitude in the Atlantic Forest. The name is Greek in origin, meaning hidden flowers.

In many ways, this genus is fairly uniform, and easier to identify than some of the other new genera. Unlike the other groups, the flowers are generally scentless. Compared to the other three genera, they have relatively large seeds (over 3mm) and large pollen. They have linear, lanceolate or narrow spatulate flower petals. They also have larger fruits (without a calyx) compared to the other genera. They (and *Lapanthus*) are the only genus with conduplicate patent stigma types.

Perhaps the most interesting feature is that *Cryptanthus* have two kinds of flowers – perfect ones with male and female parts, and male flowers. In technical terms, the genus has "andromonoecy, with hermaphrodite flowers mostly disposed in the basal/outer flower fascicles and the staminate ones concentrated in the upper/inner part of the inflorescence." Id at 61. I have never noticed this on the few of mine that bloomed!

This picture shows perfect flowers on the left, and staminate on the right. 65(2) JB & 93-99. You have to look closely to see the stigma on the left flower, but none on the two on the right.

Figure 11. Details of the flowers of *Cryptanthus boanovensis*. Photo by E. Leme.

Rokautskyia. Perhaps the biggest news from DNA studies of Louzada and the Article is that *Sincoraea* needed to be broken out of *Orthophytum*. The reason for this is actually a bigger surprise - a group of former *Cryptanthus* species are closer relatives to *Orthophytum* than *Sincoraea*. This is a group of 14 species that had been considered part of subgenus *Haplocryptanthus* but turned out to be distinct from them. This new group of former *Cryptanthus* species is now *Rokautskyia*. This genus generally has less leathery leaves than *Cryptanthus*.

Rokautskyia microglazioui (previously *C microglazioui*) at a show. Photo by Wisnev. Interestingly, there are two species that were considered so similar they have similar names. *R. microglazioui* was given it name since it looked like a smaller version of then *C glaziovii*. *R. pseudoglazioui (previously C. pseudoglaziovii)* was also named after *C. glaziovii*, but it turns out this species is now in a different genus – *Haplocryptanthus glaziovii*. [Note the slight variations in spelling are not typos, but subject to some debate.] As seen here, some *Rokautskyia* species have stems, which is very uncommon for *Cryptanthus*.

Rokautskyia species grow on rocks or the ground not far from the coast in the Atlantic Forest mountainous areas of Espirito Santo and overlap with the range of *Cryptanthus* and *Orthophytum* subg *Capixabanthus*. This area is considerably to the east of the range of *Haplocryptanthus*, so in that sense it is not surprising it is a different genus.

In some ways, there is more variation among the species than the other genera; some have stems (some don't), some have sessile inflorescences (some don't) and some have straight margins (some don't).

Rokautskyia pseudoglazioui,

formerly

Crypthanthus pseudoglaziovii.

From 6(4) Cryptanthus Society Journal 11 (1991). Photo by Leme.

R microglazioui, shown above, is similar to *R. pseudoglazioui,* from which it differs by having shorter and narrower leaves, larger spines, straight, not undulate margins, fewer-flowered fascicles, fewer ovules, and sweetly fragrant flowers with larger petals." Ramirez, Harvard Papers in Botany 3(2) 215 at 219 (1998).

As can be seen, the leaves are not at all leathery.

Given they are closer relatives to *Orthophytum* than *Cryptanthus,* do they share more features with *Orthophytum?* This question is really impossible to answer since there are thousands of features that might be compared, as well as chemical processes. It is safe to say that they have features of both, however. Some are listed below.

Like *Cryptanthus*, *Rokautskyia* species have connate sepals and petals, but no petal appendages. This is not surprising, since these are the features that had caused botanists to treat them as *Cryptanthus*. However, they have smaller seed, pollen and fruit, and the fruit retains its sepals, like *Orthophtyum*. Unlike *Cryptanthus*, they grow in higher areas between 700-1000m altitude, similar to some, but not all, *Orthophytum*. However, they grow in more humid and less sunny areas than *Orthophytum*. Some of them have peduncles or demonstrate vivipary, like *Orthophytum*.

Cryptanthus sanctaluciae
see J Brom Soc 58(1)13. 2008

Rokautskyia sanctaluciae, with a fairly long peduncle.

Photo by Leme.

Like this one, some *Rokautskyia* have are stemless but have peduncles like many *Orthophytum,* while others have stems and are sessile. *Cryptanthus, Haplocryptanthus and Forzzaea* have sessile inflorescences.

A close-up of the flowers is shown at the end of this article.

This species grows in a bromeliad rich environment about 50 km from the coast that includes *Aechmea, Neoregelia, Nidularium, Tillandsia and Vriesea.*

Rokautskyia also have some features different from both *Orthophytum* and *Cryptanthus.* Their flowers are much rounder (broadly ovate elliptic to nearly orbicular), compared to the linear, lanceolate or spathulate flowers of the other two genera. They are fragrant unlike these other two genera. They have a simple dilate stigma, which differs from the stigma of both other genera. Other features of these species are noted below in the next section.

Haplocryptanthus. As noted above, the new *Haplocryptanthus* genus is unexpectedly small since most of its group are now *Rokautskyia.* Like *Rokautskyia* they have perfect flowers with round flower petals and grow in medium to high elevated sites; in contrast, *Cryptanthus* grow below 400m, has two kinds of flowers and usually don't have round petals.

Haplocryptanthus glaziovii.

42(6) BSJ 259 (1992). Photo by Leme.

The true identity of this species had been in doubt for about 100 years after first described by Mez in 1891, until recollected by Leme.

Notice the similarities to *Rokautskyia microglazioui* and *R. pseudoglazioui,* pictured earlier (as well as *Orthophytum vagans*). Like those species, the elongated look is because it has a long stem. It has a sessile inflorescence. Despite the obvious similarities, it is in a different genus! The most obvious distinction is that it grows in a different more inland area. For *Haplocryptanthus* with a sessile inflorescence, most of the other differences with *Rokautskyia* are pretty technical although the former usually have fewer flowers.

Leme found it growing in rocky areas, about 1000-1500 m altitude.

The eight *Haplocryptanthus* species grow among or on rocks in Minas Gerais, overlapping in part the range of *Orthophytum* subg *Clavanthus* and the small *Lapanthus* genus. The name derives from the supposedly larger spines of these species as compared to *Cryptanthus*. *Haplocryptanthus* have sessile inflorescences, like *Cryptanthus*, but have straight rather than wavy leaf margins usually existing for with *Cryptanthus*.

One unusual feature of this genus is that their flowers have a "unique filament concrescence pattern" – the flowers have a basal structure where the petals, filaments and stigma are more or less fused together and the filaments are then free. This may be the only bromeliad genus with this feature. *H. lavrasensis* is even more unusual, in that its filaments remain connate above the basal structure.

Another surprise of the molecular testing in the Article is that one of the three *Lapanthus* species is actually a *Haplocryptanthus*. now considered

Haplocryptanthus vidaliorum.

Lapanthus vidaliorum **Photo by O B C Ribeiro**

The yellow flower color is quite rare for the so-called Cryptanthoid complex. Interestingly, this species is the only member of this genus with a yellow flower. It also appears to be the only *Haplocryptanthus, Cryptanthus* or *Rokautskyia* with free petals; its long tubular flower is also uncommon among these genera.

As noted earlier, there are similarities and differences for *Haplocryptanthus, Cryptanthus* and *Rokautskyia*. For example, each genus has different type of stigma. In contrast, none of them have petal appendages. Unlike *Cryptanthus*, both of the other genera have scented flowers. *Haplocryptanthus* and *Cryptanthus* generally have 2-5 (-7) flowers while *Rokautskyia* generally have 5-15 flowers.

Cryptanthus ferrarius see J Brom Soc 59(3): 105. 2009

now ***Haplocryptanthus ferrarius***.

Photo by Leme.

This is a fairly large species, with leaves almost a foot long. It had once been considered a large form of *H schwackeanus,* which has leaves less than half the size of *H ferrarius.*

Unlike the two *Haplocryptanthus* species (*H glaziovii)* shown above, this species and the one below are stemless.

While almost all of the species in these three genera have connate sepals and connate petals, there are some technical differences. The sepals of *Cryptanthus* are connate for over half their length, while those of *Haplocryptanthus* and *Rokautskyia* are connate for less than half. Petals of Haplocryptanthus and *Cryptanthus* are less than 1/3 connate, while *Rokautskyia* are connate for 1/3–1/2 of their length.

Haplocryptanthus tiradentesensis,

2007 JBS 268. Photo by Leme.

With its silver leaves this species looks more like an *Orthophytum*.

Cryptanthus micrus **photo by P L Viana**

Forzzaea. The last new genus, *Forzzaea,* has only three species. Like *Haplocryptanthus*, they grow in the rocky Campos Rupestris, growing directly north of the range of the small *Lapanthus* genus, which in turn is due north of the *Hoplocryptanthus* genus.

Now ***Forzzaea micrus***.
As seen in the above picture, *Forzzaea* have thick succulent leathery leaves unlike the leathery non-succulent leaves of *Haplocryptanthus*.

Despite being a very small genus, these three species differ in some regards. For example, two of the species have connate sepals and petals, like all *Cryptanthus, Hoplocryptanthus (except H vidaliorum) and Rokautskyia.* However, *F micra* has free ones, like *Orthophytum*. The three species don't all have the stigma type – the genus has simple-erect and simple-patent types.

Forzzaea warasii,

It turns out that one of my favorite *Cryptanthus* is now **Forzzaea warasii,** shown at HBG above. It looks quite a bit like an *Orthophytum*, and maybe even a *Dyckia*. I have never seen this specimen flower.

Like the two other new genera discussed above, *Forzzaea* have perfect and fragrant flowers, unlike those of *Cryptanthus*.

Lapanthus. The two *Lapanthus* species are also interesting in various respects. The two species share many characteristics. For example, they both have glandular trichomes along the petal margins, which is very unusual, though some of species in the other groups have them. Their stamen are not adnate to the petals, which is also very unusual for these groups. They both have laminiform petal appendages, which no other groups have. They both have conduplicate-patent stigma types, like all *Cryptanthus*. They have subtubular flowers (like *Orthophytum*), but different colored flowers (orange and white). Like *Forzzaea*, one has connate sepals and one doesn't.

Relationship among genera. As noted in an earlier article, one goal of these DNA studies is to produce a tree-like phylogeny where each branch (called a clade) in turn splits into two more clades. The split branches are sister clades and are more closely related to each other than to other clades (as a tautological matter). For example, one clade on the Cryptanthoid phylogeny shows *Orthophytum* and *Rokautskyia* as sister clades.

Rokautskyia sanctaluciae

Photo by Leme.
58(1) JBS 13 (2008).

Species in this genus tend to have more flowers than those of *Cryptanthus* and *Hoplocryptanthus*. This photo shows about 5 with petals and many more that have already bloomed.

Sometimes there isn't enough statistical support for this, and a branch splits at the same place into more than two clades. This is referred to as an "unresolved polytomy." This is the case for the base of the Cryptanthoid tree. Basically, there are 4 clades, but the relationships among them aren't clear. The four are:

1. *Haplocryptanthus* .
2. A clade that has *Forzzaea and Lapanthus* as sister clades.
3. *Cryptanthus.*
4. A branch with *Sincoraea* as one clade and the other clade is the sub-*Orthophytum* |*Rokautskyia* sister clades.

Based solely on DNA, there was weak support for clades 2 and 3 above being sister clades. Even this weak support didn't show up in a tree based on DNA and morphology.

Morphology and biogeography play a key role in determining whether sister clades should be considered a single genus or subgenus etc. For example, the Article treated these clades as 7 genera due to their different features (as opposed to one giant *Cryptanthus* genus). As another, the *Rokautskyia* branch splits into two clades, yet there was no mention of treating it as two genera.

A few corrections to last month's article.
Page 7 - the reference to *Crypt. Bromeliads* should have said *Crypt. bromeliodes*.
Page 10 - should have said *Cryptanthus* generally have odorless flowers (like *Orthophytum*), while the other three have fragrant ones.
- Also that *Haplocryptanthus* has 8 species (not 8 flowers).