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Cover photographs. Front: *Vriesea blackburniana* in cultivation. Photograph by Elton M.C. Leme. See inside for the description of this stunning species named in honor of former Journal editor, Chet Blackburn, plus two other species from an interesting area of Brazil. Back: *Tillandsia walteri*. Photograph by Leo Dijkgraaf. See the story in the issue by Leo Dijkgraaf relating his journey to the Urubamba Valley of Peru.

FEATURE ARTICLES

BROMELIAD SOCIETY BUSINESS AND NEWS

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Bromeliads in a Sacred Valley

Leo Dijkgraaf[1] **Photographs by the Author**

Searching for bromeliads in the wild, especially when less common species are sought after, or when the aim is to discover new species, requires in most cases the use of some sort of private transportation. For example a 4WD-car in mountainous areas or a small boat on rivers in a jungle. In the end the human body may have to come into action, walking and climbing to the final location.

For those who are traveling as part of an organized tour with a group of people with mixed interests, the possibilities to see bromeliads are limited, and chances of the discovery of special and new ones are very small. However, there are places where the opportunity for close encounters with bromeliads presents itself.

This is for example the case when visiting the cultural heritage of a bygone civilization like that of the Incas in Peru. This article focuses on their settlements in the Sacred Valley (FIGURE 1) near Cuzco, so named by the Inca people themselves and now simply called 'ruins'. Notably the ruins at Pisac and Ollantaytambo offer some bromeliad species within easy reach. Both places are situated high on the slopes of mountains that without the steps of the stairways constructed centuries ago would be difficult to access.

Amongst the ubiquitous puya's, several tillandsia's can be found, most common are *Tillandsia nana* (FIGURES 2,3) and *T. paleacea* (FIGURES 3,4). A species that in the vegetative state looks like a large *T. nana* at Ollantaytambo is *T. cauligera* (FIGURES 5,6), the leaves taking on a light pink color in the basking sun at the elevation here. All these plants are saxicolous, but at Pisac *T. walteri* is found growing in the bushes (FIGURE 31, BACK COVER).

Also situated in the valley of the river Urubamba is the small town Calca. Along the main road nearby *Tillandsia micans* (FIGURE 7) clings to vertical rocks. From Calca a winding dirt road leads to Lares; the distance of 60 km is covered in two hours by car. Before reaching Lares, the giant *Puya raimondii* (FIGURE 8) is found at a place called Pampacorral. There are about 400 plants in this colony ('rodal') but none was in flower; I learned that some years ago one was flowering.

For the sporting types there is one other opportunity to spot bromeliads in this part of the world—by walking the well known trail to Machu Pichu, a distance of some 40 km that takes 3-4 days. More tillandsia's are encountered here, but for a larger diversity of species other parts of Peru, such as the north, are better choices. However, travel to these regions is less organized, due to the lack of sites that appeal to a wide public. So here the motto is: find some other bromaniaks, hire a car and go for the adventure!

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Figure 1. Urubamba-valley seen from ruins at Pisac.

Figure 3. *Tillandsia nana* and *Tillandsia paleacea.*

Figure 2. *Tillandsia nana.*

Figure 4. *Tillandsia paleacea.*

Figure 5. *Tillandsia cauligera.*

Figure 6. *Tillandsia cauligera.*

Figure 7. *Tillandsia micans.*

Figure 8. *Puya raimondii.*

Aechmea 'Morgana'

Derek Butcher, BSI Cultivar Registrar

A few months ago I noticed in the New Zealand Bromeliad Journal that someone recommended that a plant called 'Morgana' that had no spines should be called 'Primera'. As is my wont, I wrote my thoughts about this in our local gazette pointing out that the Bromeliad Cultivar Register says that 'Morgana' is spineless and that there were 16 different cultivar names given to *Aechmea fasciata*.

Next on the scene was Herb Plever in New York who politely said that Corn. Bak had always said this cultivar had spines! Peter Bak confirmed this fact and the Cultivar Register will be corrected. I knew that a spineless form of 'Morgana' was being sold in Florida and is in Michael Kiehl's catalogue as such. I discussed my problem with Dennis Cathcart. If you have a spineless *Aechmea fasciata* how do you identify it? There are two names in the Cultivar Register which specifically mention "spineless." These are 'Primera' which has a plant patent in Europe and 'DeLeon' which had a plant patent in 1992 in the USA and I am not sure if it is current.

As I have pointed out before, the validity of a plant patent is a matter for the plant seller not the Registrar! If you have a spineless *Aechmea fasciata* you are not likely to use either 'Primera' or 'DeLeon' especially if you are selling them! These two names are just examples of this form and are not exclusive. The Cultivar Register 1998 suggests that spineless forms of *Aechmea fasciata* were in existence and circulating in Florida in the 1980's well before 'DeLeon' was patented. It is possible this is the reason for the alleged spineless 'Morgana'. This should be sold as *Aechmea fasciata* 'Spineless' or, dare I suggest 'Smoothie' which I will add to the Cultivar register if any want to use it and forgive me my warped sense of humour! This name should be used only when the plant cannot be traced to either 'Primera' or 'DeLeon'.

My discussions with Dennis Cathcart revealed that Chester Skotak had written notes on this spineless phenomenon and the following makes fascinating reading.

Notes from Chester Skotak on Spineless Aechmeas

> Many years ago there existed an *Aechmea fasciata* that was spineless, possibly from Japan. This was a common *Aechmea* 20 years ago and many people had this in their collections and perhaps still do. Since this is a fairly good looking *A. fasciata* perhaps it also popped out of a meristem program in Japan as a chimera. This *A. fasciata*, when crossed with any other *A. fasciata* produced spineless seedlings. This F1 cross is easy to duplicate in a hobby greenhouse and has been by several growers. I believe that all

A. fasciata that are spineless originated from what was known as "the Japanese clone," although with bromeliads nothing can be ruled out. Chimeras do appear but the rate of mutation from spiny leaf to smooth leaf must be very rare. It would be easy to understand how a spineless mutation would go unnoticed to the untrained eye.

Today there are many hybrids of aechmeas that are spineless. They present an interesting challenge for the very reason Dutrie hinted at in 1946, that *Aechmea fasciata* and *Aechmea chantinii* produce an intermediate cross between the two parents, with the color of chantinii and other characteristics well divided. I can say after making many hundreds of crosses that I have found *A. fasciata* to be dominant in the hybrid in both shape of the inflorescence, the color and the size. It is in fact very dominant in color when used in crosses. This can be seen when hybrids of others from the *Platyaechmea* group crossed with *A. fasciata* usually bloom with some shade of reddish-pink to pink bracts.

Taking the spines off the *Aechmea fasciata* was the easy part; the hard work lay ahead–producing spineless *A. fasciata* in different colors and forms and then making the hybrid between the spineless *A. fasciata* and the *Aechmea chantinii-A. tessmannii* group. In addition, the plants should be culturally perfect, grow fast, clean, and not suffer transpiration burn on the leaves. These are the same basic hybrids that Dutrie made a half century earlier but the accessibility of obtaining more types of *Aechmea*, as well as growing conditions, and general knowledge about bromeliads has changed a lot in the last fifty years.

Aechmea flavo-rosea, A. dealbata, A. caesia, and color forms of *A. fasciata* such as the "Ivory" or the plant known as "Lavender" were a few of the plants used to change the colors of the *A. fasciata*. In the *Platyaechmea* group I use *A. chantinii* with a stout yellow inflorescence that produces excellent hybrids. Currently we are using yellows and reds and oranges and two albino types of *A. tessmanii* and *A. cucullata*. The more hybridizing that I did the more it became apparent that *A. fasciata* worked best in hybrids when plants without trichomes were used, or at best very few trichomes. Commercially the trichomes are more appealing, but it is a true challenge to produce a bright inflorescence and have the leaves with a silver cast to them. I had ruled out any commercial types of *A. fasciata* with just too many trichomes and they were not bright enough or fast enough growing. Fewer trichomes give more color. That is the current status of my program with *Aechmea*. I will follow this article up in ten years time and see where this was all leading. Hopefully, I will reach a point of having a spineless *Aechmea* hybrid, a nice silver color on the leaves, and a large well centered, bright inflorescence, all that I ever hoped for in a hybrid, but will I ever be satisfied?

If *Aechmea* species have the ability to discard their spines, are they coming or going in the evolutionary chain? Where do the spines go? Here is where I walk out on a limb. All *Aechmea* that have had the spines hybridized out have an unusual fold somewhere running along the length of the leaf (FIGURE 9). Is there one or two genes that have been eliminated, or are they simply masked and have been there all the time just relocated somewhere else? Any observant grower or hobbyist of the Bromeliaceae can see this phenomenon by simply holding the leaf up to the light. Sometimes it is a very prominent fold other times it is a faint line. At times the inflorescence of a spineless *Aechmea* will show spines on the primary or secondary bracts, sometimes very prominent and sometimes hardly at all. This also occurs with pineapples, *Ananas comosus*, where the crown is spiny. These spiny crowns are discarded and considered only as primitive relics of their ancestors. If a spineless pineapple produces a spiny top, are the genes still there for spines? This fold in the leaf is easily observed on several varieties of spineless *Ananas comosus*. Perhaps this unusual doubling in the leaf will one day be looked at closer and we can move one step further along in the study of knowledge about our favorite plants, the bromeliads.

Closing Comment

Herb Plever points out that his spined 'Morgana' also produces 'pipes' in some plants and this can follow into the offsets. It is possible that 'piping' may well take over from 'quilling' as a favourite Bromeliad discussion topic!

Photograph by Michael Kiehl.

Figure 9. *Aechmea fasciata* 'Smoothie'.

Bromeliadism...Philosophy, Religion, or Disease?

Jerry Krulik[1]

How many times have you said to yourself or out loud "I *have* to have that plant!" And then as soon as it is in your hot little hands, you next say, "*where* can I put it?" Most growers go through a fairly short initiation period, whereby they collect almost any bromeliad because their growing space is open. Sooner or later, depending more on the size of their property than pocketbook, they have to begin to exercise some, or lots of restraint because they are running out of room.

Many learned people have studied this phenomenon, and as usual there are no universally accepted answers. There are three main theories of behavior which are promulgated to best explain why any normal rational human being would submerge themselves in a world of – dank rooting leaves, musty, smelly bromeliad tank water, and mosquito clouds, blood dripping from lacerated skin due to trying to separate woody cuttings of barbed leaved plants, obsessive watering, weeding, potting, and plant placement, and so on — instead of enjoying the sunshine, talking walks on the beach, or doing anything else that does not require daily dedication for the rest of your life.

There is the *philosophical* argument. Perhaps we grow these plants because we believe in them, that they purify the air and gladden the heart, soothe the eye, calm the spirit, enlighten the mind, as any great philosophical work will do? That our justification to **Philosophical Bromeliadism** is a dedication to the world of life and the collectivity of humanity, for if we did not spend every minute propagating and growing them, they could disappear from this earth (or worse, from our own collections)?

Or, do we embark on a religiously moral crusade to convert everyone to Bromeliadism? Do we give, even thrust, extra cuttings, like unwanted kittens, into the arms of reluctant strangers and relatives hoping to convert them to the **Religion of Bromeliadism**? Perhaps we corner poor deluded strangers at parties, who innocently ask, "Do you have a hobby?" We follow them around as they try to break free as we expound the virtues of Bromeliadism over Orchidism, Cactusology, Succulentism, Fernophrenzy, Bulbocoddling, Rosemania, and other such related heresies and wrongful actions. And woe betide the fallen believer who may convert to some totally alien religious movement like stamp collecting, or even fish farming in their house!

Perhaps we may also consider **Bromeliadism as a Mental Disease**, like kleptomania. Of course many people hide it under a cloak of respectability by referring to it by the catchall phrase "collecting," as if this makes it normal. But, is anyone normal who has 15 color varieties of one kind of plant, yet still drools when he/she sees another one with just a hint of red spots

[1] San Clemente, California. Reprinted with minor modifications from Pup Talk 12(1), January 2005, Saddleback Valley Bromeliad Society.

where the other plants have yellow wrinkles? Does this sound like a normal person to you? Obsession is often a characteristic of sanitarium occupants.

I, of course, have the capacity to stand aside and objectively view my fellow Bromeliadists in a rational manner. Whatever behavioral theory may apply to them has no real correspondence in *my* world. I am a believer in the highest form of Bromeliadism, in my opinion, which is the Tillandsiast. After all, tillandsias are some of the most rarefied bromeliads since so many can be grown in soil-less condition. This obviates the need for useless circular philosophical questions, like "what soil is best?" or, "what pot shows them off better?" since you can just nail them to a wall or hang them from a patio roof. Tillandsias are the purest kind of plant, swinging in the pure air and sunlight like God's angels. Surely, suspicion that tillandsia collecting is a disease is easily disproved as there are only 600, or maybe 800 named species to collect, and perhaps a few hundred more varieties and a couple of thousand forms and colors and hybrids, so obsessive collecting is not a real problem, in my humble opinion.

Whatever your avocation, as long as you are true to the precepts of Bromeliadism, may your pups grow and prosper!

Importation of Bromeliads Into Australia

Bob Reilly[1]

Importing bromeliads is one means (perhaps sometimes the only way) of obtaining certain plants. However, while some people have achieved a high survival rate when importing bromeliads, others have not. The points outlined in this article may assist you to achieve a good outcome if you decide to import bromeliads.

• First of all though, importing plants is expensive and many are sometimes lost in the quarantine process. It is best to buy locally (if the plants are available) and avoid the potential problems if you can.

• Talk to someone who has recently imported bromeliads to obtain an up-to-date list of those things, which you should do and, just as importantly, not do.

• If you're importing plants of a bromeliad species (as opposed to a hybrid) it is often worth considering importing one, which has a slightly different genetic composition to other examples of that species already in your area or country. This is desirable, as it is only possible to obtain seed of some species if plants with different genetic compositions (known as clones) are used as "parents". Such species are known as "self sterile".

[1] Toowong, Queensland, Australia. E-mail: bob.reilly@nrm.qld.gov.au. Reprinted from Bromeliaceae.

• Make sure all of the paperwork required by your country's quarantine authority is complete before you order your plants, or you leave on your trip if you're buying them in person.

• There is often considerable variation in bromeliads. This is true for both species and, especially, hybrids. To be sure of getting the plant you really want it is best to buy it in person or at least obtain a photograph of it from the nursery.

• The time spent in transit, and the treatment plants receive during that process, is a major factor in determining whether your plants will arrive in a healthy and vigorous, or weakened, condition. Few weakened plants survive the quarantine process.

• While flowering plants are attractive, they may be less likely to survive the journey to your home than non-flowering ones.

The best approach is to buy your plants overseas yourself as this enables you to pack them carefully (plants should be packed in a "bare rooted" condition, after being dipped in an insecticide and free of any insects, scale or disease), and bring them back with you.

This approach means transit time will typically be much less than when you're relying on the nursery to send them. Death-inducing experiences such as plants freezing to death because they've been left on an airport tarmac in the middle of a blizzard will also be avoided.

• If you are relying on a nursery to pack and send your plants, four points worth remembering are:

  • The fewer times a consignment of plants has to be put on a different aircraft on its journey, the better. For example, other things being equal, it is better to buy plants from a nursery on the west coast of the United States of America than its east coast, if you are importing them into Australia or New Zealand.

  • Specify to the nursery how you want the plants sent eg airfreight, airmail etc. Unless you've a strong preference for a particular method, it is often best to follow the nursery's advice.

  • Ask the nursery to conspicuously label the boxes containing your plants with "Perishable" or "Live Plants" stickers.

  • Ask the nursery to fax you a copy of the consignment note, or similar document (or telephone you with its details) when they send the plants. This will enable you to "track" the plants' progress through the shipping system, and advise the shipment's likely arrival time to your country's quarantine authority.

• If the plants are treated with methyl bromide gas, it is important to remove the gas residue quickly so as to avoid further damage to them. Methyl bromide gas is much heavier than air. So it tends to stay "trapped" between a plant's leaves. Further, the gas dissolves readily in water where it remains active. (In other words, it can still damage the plant). One way of treating plants to deal with this situation is to:

- If possible, arrange with the quarantine authority to have your plants treated in the morning, rather than the afternoon, so the next steps can be undertaken immediately.
- Immerse them fully in a container of water, (this will tend to dissolve any remaining methyl bromide gas into the water).
- Hang, or hold them, upside down so all the water drains out (this will minimise the amount of water containing dissolved methyl bromide which is left on the plant
- Mist the plant and leave it bare-rooted for 24 hours.
- Repeat the "dipping in water" process outlined above.
- If appropriate, pot the plant.
- Remember your quarantine authority is doing an important job trying to keep disease and pests out of the country. Please observe quarantine rules and don't try to smuggle plants in.

Best of luck in your importing efforts!

Acknowledgments

I gratefully acknowledge the advice I received from Olive Trevor and Barry Genn in preparing this article.

Three New Miscellaneous Species of Bromeliaceae from Bahia, Brazil

Elton M.C. Leme[1] **Drawings and Photographs by the Author**

In the 1500's, when European colonization began, the original area of the Brazilian Atlantic Forest was about 1,300,000 km². It has been reduced to some 98,800 km², or 7.6% of its original extent (Morellato & Haddad, 2000). In Southern Bahia, the first Europeans found a vast territory occupied by a luxuriant Atlantic Forest forming a belt of approximately 100 to 200 km wide along the Atlantic coast. Despite the presence of all kinds of economic activities in this coastal zone through the centuries, the deforestation process in Southern Bahia was increasingly intensified only after the 1960's. The forested areas were then reduced to a high number of small fragments, a process of devastation that remains far from being under control even in the beginning of the 21st century, to the point that this ecosystem is considered one of the most endangered in the world (Ranta et al. 1998).

The fragmentation process of the Atlantic Forest, in addition to immediate local extinction, may have long term unfavorable effects on plant populations through changes in key ecological processes, such as pollination and seed dispersal (Ranta et al., 1998; Silva & Tabarelli, 2000). There are also negative microclimatic consequences which increase the proportion of biologically depleted edge zones in islands of forest vegetation in contrast with the more preserved but gradually reduced core areas. The obvious consequence is the loss of biodiversity, or the so called megadiversity in the case of Southern Bahia. Based on that and considering the high number of endemic species specially adapted to those forested habitats, it is reasonable to suppose that many species already have gone extinct before their discovery (Morellato & Haddad, 2000).

However, in Southern Bahia, the comparatively recent fragmentation process has not yet been enough to cause a full biological collapse in the remaining islands of native vegetation. Even in small forest fragments that may collapse in the coming decades and bring to extinction a vast myriad of unique creatures, an amazing part of the biodiversity is still there, making it possible to find completely unknown species of different bromeliad genera, as described below.

Species

Aechmea laevigata Leme, sp. nov. **Type:** Brazil, State of Bahia: field collected in Ibicuí-Nova Canaã, Serra da Boa Vista, Apr. 2001, by *Edmundo Silva s.n.*, and flowered in cultivation Feb. 2003, *E. Leme 5135* (Holotype: HB). FIGURES 10 A-E, 11.

[1] Herbarium Bradeanum, Rio de Janeiro - RJ, Brazil. E-mail: leme@tj.rj.gov.br

Species nova a *Aechmea viridostigma* Leme & H. Luther, cui affinis, laminis foliorum integris, floribus ramulorum plus numerosis, bracteis scapalibus quam internodia distincte brevioribus, sepalis aurantiacis, apice mucrone duplo breviori, petalis subspathulatis, apice obtuse-emarginatis, stigmate albo, et receptaculo aurantiaco differt.

Plant epiphytic, flowering ca. 40 cm tall. ***Leaves*** ca. 10, rosulate, suberect, subcoriaceous, forming at base a narrowly funnelform rosette; ***sheaths*** elliptic, 12-13 x 6-7 cm, densely and minutely pale lepidote on both sides, dark purple toward base mainly inside; ***blades*** sublinear, 23-30 x 30-34.5 cm, subdensely and inconspicuously white-lepidote on both sides, adaxially green, abaxially reddish-purple, margins entire, apex acute and distinctly apiculate, apiculus 4-5 mm long. ***Scape*** erect, slender, ca. 30 cm long, ca. 0.4 cm in diameter, green, sparsely white-lanate to glabrous; ***scape bracts*** lanceolate, acuminate, 28 x 8-10 cm, green to dark purple, entire, sublanate near the base, white-floccose toward apex, thin in texture, nerved, erect, distinctly shorter than the internodes and exposing the scape. ***Inflorescence*** shortly paniculate, bipinnate, erect, ca. 5 cm long, ca. 4 cm in diameter, without any apical coma of sterile bracts, rachis 2-3 mm in diameter, sparsely white-lanate, green; ***primary bracts*** narrowly lanceolate, slenderly acuminate, 15-20 x 4 mm, entire, thin in texture, spreading, green, white-floccose, trichomes fimbriate, nearly equaling to shorter than the branches; ***branches*** ca. 2, subspreading, ca. 25-30 mm long (including the petals), 6 to 7-flowered, basal peduncle inconspicuous, 2-3 mm long, ca. 2 mm in diameter, green, white-floccose, rachis very short, straight, green, sparsely white-lepidote, trichomes fimbriate; ***floral bracts*** inconspicuous, ovate-triangular to subreniform, acute and apiculate to acuminate, stramineous, nerved, entire, inconspicuously and sparsely white-sublanate (including the margins), ecarinate, distinctly shorter than the ovary, 2-3 mm long, ca. 2 mm wide at base. ***Flowers*** sessile, 17-19 mm long, odorless, densely and polystichously arranged (including those of the branches), suberect to nearly spreading; ***sepals*** 5-6 x 4 mm (including the apical mucro), strongly asymmetrical with the lateral membranaceous wing rounded and about equaling the midnerve and shorter than the apical ca. 1 mm long mucro, connate at base for ca. 2 mm, orange, ecarinate, sparsely white-lepidote toward base, trichomes fimbriate, inconspicuously verrucose at base; ***petals*** subspatulate, obtuse-emarginate, 12-13 x 4 mm, free, white, erect except for the suberect apex at anthesis, bearing 2 appendages at base, ca. 4 mm long, irregularly long acicular-digitate, as well as 2 distinct longitudinal callosities ca. 7 mm long; ***filaments*** terete, the antesepalous ones free, ca. 8, the antepetalous ones basally adnate to the petals for 5 mm, ca. 7 mm long; ***anthers*** 2.5-3 mm long, dorsifixed near the middle, base sagittate, apex apiculate; ***stigma*** conduplicate-spiral, elliptic, blades ca. 2 mm long, white, shortly lacerate; ***ovary*** 5-6 mm long, terete, orange, sparsely white-lepidote, trichomes fimbriate; ***epigynous tube*** ca. 1.5 mm long; ***placentation*** apical; ovules obtuse to obtusely apiculate. ***Fruits*** unknown.

Discussion

The name of this new species is a reference to the completely spineless leaf blades, which gives it a very delicate general appearance and distinguishes it from its close relative, the recently described *Aechmea viridostigma* (Leme & Luther 2003). Other discrete morphological differences of *A. laevigata*, when compared to *A. viridostigma*, are the more numerous flowers per branch (6 to 7 flowered vs. ca. 2 flowered), scape bracts distinctly shorter than the internodes (vs. equaling to slightly shorter than the internodes), sepals orange (vs. greenish-yellow) and with a apical mucro twice shorter (ca. 1 mm vs. ca. 2 mm long), petals subspatulate with obtuse-emarginate apex (vs. sublinear with acute apex), and by the white stigma (vs. green) and the orange ovary (vs. greenish-yellow). In addition to these differences, *A. laevigata* has no apical coma of sterile bracts on the inflorescence apex, while *A. viridostigma* presents a coma of numerous small sterile bracts on the apex of the inflorescence, which can be clearly observed in figure 3 in Leme & Luther (2003).

Aechmea laevigata was originally found by the orchid and bromeliad collector Edmundo Ferreira Silva in the mountainous region between Ibicuì and Nova Canaã, called Serra da Boa Vista, where inaccessible areas at the altitude of 500 to 600 m still feature well preserved fragments of Atlantic Forest surrounded by pasturelands. Like its closer relatives, *A. laevigata* is a typical inhabitant of the lower tree trunks and the shaded rocks inside the remaining forest.

Quesnelia dubia Leme, sp. nov. TYPE: Brazil, Bahia: field collected in Camacã, April 2001, by *Edmundo Silva s.n.*, and flowered in cultivation Mar. 2004, *E. Leme 5152* (Holotype: HB) FIGURES 10 F-L, 12, 13

A *Quesnelia edmundoi* var. *rubrobracteata* E. Pereira, cui affinis, laminis foliorum perminute spinulosis, ramis plus numerosis, bracteis floriferis apice emarginatis, floribus longioribus et petalis spathulatis, subacutis, albis differt.

Plant flowering ca. 43 cm tall, propagating by short, stout, basal stolons. ***Leaves*** ca. 16 in number, thinly coriaceous, forming a broadly funnelform rosette; ***sheaths*** broadly ovate-elliptic, 11-12 x 8 cm, densely brown lepidote on both sides, pale colored; ***blades*** sublinear, suberect-arcuate, 16-20 x 4.5-5.3 cm, apex rounded to subacute and minutely apiculate, subdensely to densely and inconspicuously white-lepidote on both sides, trichomes sometimes forming inconspicuous crossbands, green, except for the sometimes purplish-wine abaxial surface, margins densely and minutely spinose, spines whitish or reddish, triangular, ca. 0.5 mm long or shorter, 2-5 mm apart, straight or slightly retrorse; ***scape*** suberect, ca. 30 cm long, 0.5-0.6 cm in diameter, rose to dark red, glabrous; ***scape bracts*** narrowly ovate-lanceolate, acute and apiculate, remotely spinulose near the apex to entire, erect, distinctly exceeding the internodes, completely hiding the scape, papyraceous, nerved, sparsely and inconspicuously white-lepidote, 4.5-6 x 2.4 cm, the upper ones red toward the apex, slightly inflated. ***Inflorescence*** bipinnate, digitate, erect, ca. 9 cm long, ca. 6 cm in diameter, exceeding the leaves, rachis ca. 0.5 cm in diameter, short, red, glabrous; ***primary bracts*** ovate, acute and minutely apiculate, 2.5-4 x 1.8

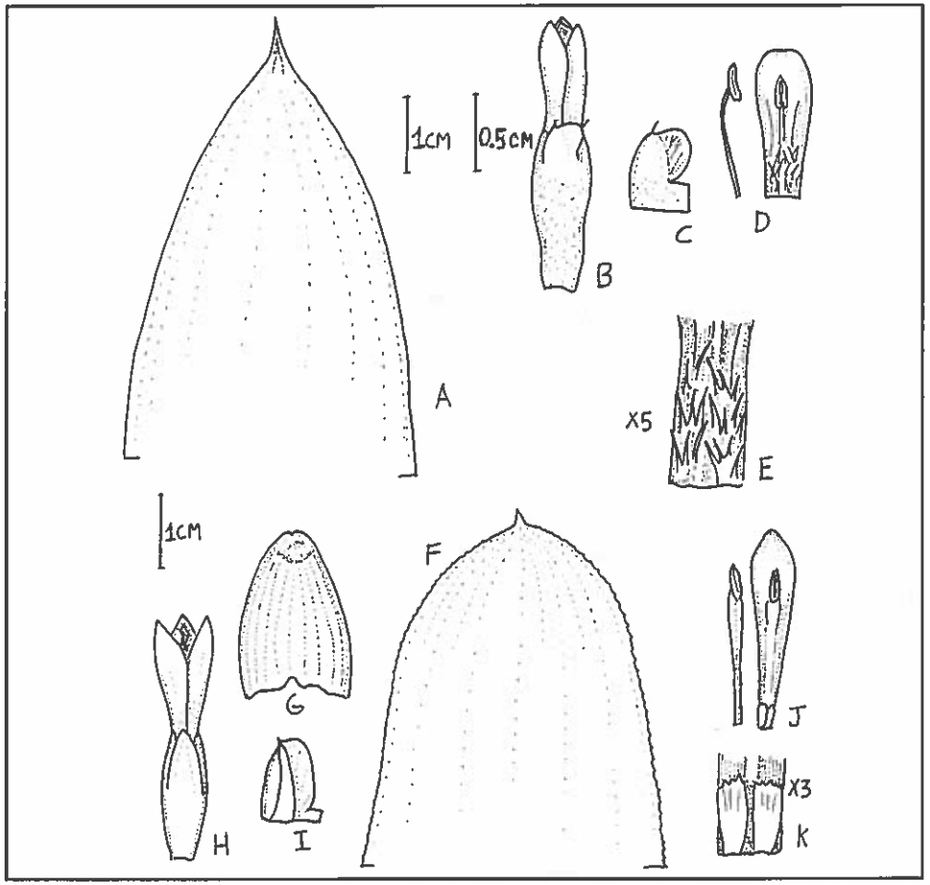

Figure 10. *Aechmea laevigata*. A-E: A. Leaf apex. B. Flower. C. Sepal. D. Petal and stamens. E. Petal appendages. *Quesnelia dubia*. F-K: Leaf apex. G. Floral bract. H. Flower. I. Sepal. J. Petal and stamens. K. Petal appendages.

cm, subspreading, apex incurved, nearly equaling to distinctly shorter than the branches, nerved, glabrescent, membranaceous, red except for the greenish-white apex; ***branches*** ca. 8 in number, suberect to nearly spreading, densely arranged, subellipsoid to nearly cylindrical, acute, terete or nearly so, densely flowered, 3.5-4.5 cm long, 1.7-2 cm in diameter, shortly pedunculate, peduncle ca. 0.5 cm long, slightly complanate, red, glabrous; ***floral bracts*** broadly ovate, apex emarginate, slightly cucullate, inconspicuously mucronulate, 18-20 x 15 mm, red except for the green base and the greenish-white apex, nerved mainly inside, membranaceous, glabrous, strongly convex and cymbiform, imbricate at anthesis, ecarinate except for the carinate basal ones, equaling to slightly exceeding the sepals, margins entire. ***Flowers*** 32-33 mm long (including the petals), sessile, densely and polystichously arranged, fragrance or odor not detected; ***sepals*** suboblong, apex minutely apiculate, apiculus not pungent, asymmetrical with the lateral membranaceous wing about equaling the mid-

nerve, 10-11 x 6 mm, shortly connate at base for ca. 1 mm, white, glabrous, the posterior ones obtusely carinate, the anterior one ecarinate; ***petals*** subspatulate, apex subacute, ca. 27 x 6 mm, free, white, suberect at anthesis, bearing two narrowly obovate, ca. 4 x 1.5 mm, appendages at base, with free lobes ca 2.5 mm long, subobtuse and irregularly and minutely crenulate; ***filaments*** complanate and dilated toward apex, ca. 18 x 1.5 mm, the antepetalous ones adnate to the petals for ca. 15 mm, the antesepalous ones free; ***anthers*** elliptic, ca. 4 mm long, base shortly sagittate, apex obtuse and remotely apiculate, fixed at 1/2 of its length above the base; ***ovary*** ca. 5 mm long, ca. 5 mm in diameter at apex, subtrigonous, green, glabrous; ***placentation*** apical; ***ovules*** obtuse; ***epigynous tube*** inconspicuous; ***stigma*** ellipsoid, conduplicate-spiral, white, blades densely and minutely crenulate. ***Fruits*** unknown.

Discussion

The great genetic and structural diversity in the subfamily Bromelioideae constitutes a true challenge to taxonomy—it brings an extra complication in the circumscription of its genera. Sometimes, the generic limits are so precarious that, from time to time, it is difficult to determine the genus of a species even when complete information is available (Smith & Downs, 1979). That is the case of *Quesnelia dubia*; its unique set of morphological features makes its generic position dubious.

As all exquisite bromelioids, this new species could easily be a victim of the almost irresistable "*Aechmea* attraction effect" due to the precarious delimitation of *Aechmea* and its paraphyletic composition of a high number of taxa. If included in *Aechmea* subgen. *Aechmea*, this new taxon comes close to the ambiguous *A. prava* E. Pereira, from Rio de Janeiro State close to the border of São Paulo State. On the other hand, the inflorescence of *Quesnelia dubia*, with distinctly strobilate spikes may resemble the genus *Hohenbergia*, and more precisely the mysterious *H. membranostrobilus* Mez, a species collected by A. Glaziou in Rio de Janeiro State more than one century ago.

It is important to stress here that despite the bipinnate inflorescence in the studied specimen of *Quesnelia dubia*, a photograph taken in field by the collector shows one of the specimens with a tripinnate inflorescence at base, with a basal apparently shortly pedunculate primary branch slightly separated from upper congested ones bearing three secondary spikes, which is a typical inflorescence structure for some *Hohenbergia* species.

However, due to the combination of its inflorescence structure, floral bracts conformation, flower size, sepals, filaments, petals appendages and ovules characteristics, the inclusion of this new species in *Quesnelia* appears to be more reasonable than the previous options. In the decision to include this new species in the genus *Quesnelia* it is important to keep in mind that its current circumscription, as highlighted by Vieira (1999), is determined by the presence of unrelated taxa like *Q. arvensis* (Vell.) Mez, *Q. marmorata* (Lem.) Read, *Q. lateralis* Wawra, and *Q. edmundoi* L. B. Sm., the last here considered the closest relative of *Q. dubia*.

Figure 11.
Aechmea laevigata
flowering in cultivation.

Figure 12. *Quesnelia dubia*
flowering in cultivation.

Figure 13. Close up of
the inflorescence of
Quesnelia dubia.

Figure 14.
Vriesea blackburniana
flowering in cultivation.

In the complex of *Quesnelia edmundoi*, this new species is closely related to the variety *rubrobracteata* E. Pereira, which is an endemic taxon from low altitude Atlantic Forest in Rio de Janeiro State (Leme, 1994). A very preliminary morphological analysis suggests that the species status for *Q. edmundoi* var. *rubrobracteata* should be seriously considered in future revisions, as well as its eventual synonymy relationship with *A. prava* and *H. membranostobilus* (H. Luther, pers. comm.), which is reinforced by their geographical distribution.

The main differences of *Quesnelia dubia* in comparison to *Q. edmundoi* var. *rubrobracteata* are leaf blades with very small marginal spines (ca. 0.5 mm vs. 3-5 mm), inflorescence bearing more numerous spikes (ca. 8 vs. 1-4 in number), floral bracts with emarginate apex (vs. acute, obtuse or rounded, but not emarginate), flowers longer (32-33 mm vs. 23-26 mm long), and by petals white (vs. lilac), spathulate (vs. sublinear), with a subacute apex (vs. obtuse to obtuse-cuculate).

Vriesea blackburniana Leme, sp. nov. **TYPE:** Brazil, Bahia: field collected in Nova Canaã, Serra da Boa Vista (Oricana), 600-700 m, Aug. 15, 2001, by *E. Leme 5292, R. F. Reis Jr., J. C. M. Falcon & E. Silva*, and flowered in cultivation, Feb. 2003, *E.M.C. Leme s.n.* (Holotype: HB; isotype: RB).

FIGURES: Cover, 14, 15

A *Vriesea schwackeana* Mez, cui affinis, laminis foliorum subter dense et manifeste lepidotis, ramis latioribus floribus laxe dispositis, rhachidi flexuosa et bracteis floriferis haud imbricatis, ovatis et angustioribus differt; affinis *V. monacorum* L. B. Sm. sed laminis foliorum subter dense et manifeste lepidotis, scapo ca. 32 cm longo, inflorescentia ca. 43 cm longa, bracteis floriferis longioribus et sepalis ecarinatis vel obtuse carinatis differt.

Plant epiphytic, lacking rhizomes, flowering ca. 90 cm high; ***leaves*** ca. 23, suberect, forming at base a crateriform rosette; ***sheaths*** ovate to elliptic, 10-11 x 8 cm, dark purplish-brown, densely and minutely brown-lepidote on both sides, thinly coriacous; ***blades*** sublinear, not narrowed at base, apex subacute to rounded and apiculate, 32-38 x 3.5-4.5 cm, green, thin in texture, abaxially the green color obscured by a dense layer of white trichomes in contrast with the sparsely and inconspicuously white-lepidote adaxial surface. ***Scape*** erect, stout, ca. 32 cm long, 0.7-0.8 cm in diameter, red, glabrous; ***scape bracts*** foliaceous or subfoliaceous, acute and distinctly apiculate, enfolding the scape, distinctly exceeding the internodes, blades suberect, the upper ones with reddish base. ***Inflorescence*** bipinnate, narrowly and laxly paniculate, erect, ca. 43 cm long, ca. 22 cm in diameter, distinctly exceeding the leaves, rachis 4-5 mm in diameter, slightly sulcate, red, glabrous, internodes ca. 3.5 cm long; ***primary bracts*** exceeding the basal peduncle, subspreading with the branches, the basal ones resembling the upper scape bracts, 6-7 x 1.8-2 cm, about equaling the middle of the branches, the upper ones narrowly ovate, acuminate, 4-5 x 1.7-2 cm, red, sparsely white-lepidote adaxially; ***branches*** the lateral ones ca. 12, subspreading, 12-15 x 6-6.5 cm,

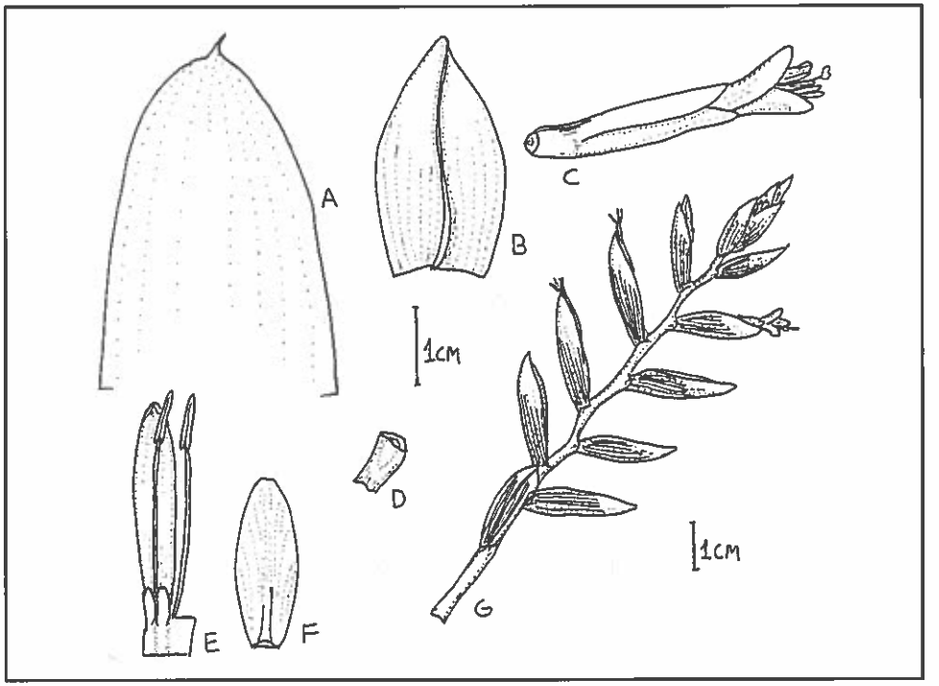

Figure 15. *Vriesea blackburniana*. A. Leaf apex. B. Floral bract. C. Flower. D. Pedicel. E. Petal. F. Sepal. G. Branch.

laxly 8 to 10-flowered, basal peduncle 2.5-3.7 cm long, ca. 0.3 cm wide, slightly complanate, red, glabrous, bearing 1 to 2 red, carinate or bicarinate sterile bracts, rachis 1.5-2-5 mm in diameter, flexuous, slightly angled, red, glabrous, internodes 6-10 mm long, the terminal branch resembling the lateral branch but shorter, erect, ca. 5-flowered; ***floral bracts*** ovate, apex acute, incurved, 32-34 x 18 mm, thin in texture, glabrous, distinctly carinate, without decurrent auricles, slightly exceeding the sepals, the basal 2/3 red, the apical 1/3 yellow. ***Flowers*** distichous, divergent, subspreading at anthesis, not secund, ca. 42 mm long (with extended petals and not including the stamens), diurnal, odorless; ***pedicels*** slender, ca. 7 mm long, 3-4 mm in diameter, green; ***sepals*** narrowly elliptic, narrowly emarginate, ca. 23 x 8 mm, yellow, ecarinate or obtusely if at all carinate toward the base, thin in texture to membranaceous toward the apex, glabrous; ***petals*** sublinear, apex narrowly obtuse-emarginate, suberect toward apex at anthesis, ca. 35 x 5 mm, yellow, bearing 2 appendages at base, 9-10 mm long, blades oblong-elliptic, rounded, ca. 5 x 2 mm; ***stamens*** slightly exceeding the petals; ***filaments*** adnate to the petals for ca. 5 mm; ***anthers*** ca. 6 mm long, dorsifixed near the base, base distinctly sagittate, apex obtuse; ***stigma*** convolute-bladed, yellow, ca. 1.5 mm in diameter; ***ovules*** long caudate.

Discussion

This new species is closely related to *Vriesea schwackeana*, but differs from it by the leaf blades densely and distinctly lepidote abaxially (vs. obscurely lepidote), branches broader (6-6.5 cm vs. 2-3 cm wide) and laxly flowered (vs. densely flowered), rachis flexuous (vs. nearly straight), floral bracts not imbricate at anthesis (vs. imbricate), ovate (vs. broadly elliptic) and slightly narrower (ca. 18 mm vs. 20-24 mm wide). *Vriesea blackburniana* also resembles *V. monacorum*, differing from it by the leaf blades densely and distinctly lepidote abaxially (vs. obscurely lepidote), scape shorter, ca. 32 cm long (vs. ca. 80 cm long), inflorescence longer, ca. 43 cm long (vs. ca. 30 cm long), floral bracts longer (32-34 mm vs. ca. 26 mm long), sepals ecarinate or obtusely if at all carinate (vs. carinate).

Vriesea blackburniana was found growing as an epiphyte, on tree trunks ca. 5 m above the ground in a well preserved Atlantic Forest fragment, in an elevation of about 600-700 m. Its type locality, despite the fragmentary condition, shelters a luxuriant bromeliad community represented by *Aechmea* spp., *Billbergia* sp. *Canistrum* sp., *Guzmania lingulata*, *Neoregelia* spp, *Nidularium* spp. (including *N. bicolor, N. longiflorum and N. procerum*), *Portea* spp., *Racinaea spiculosa*, *Ronnbergia silvana*, *Tillandsia* spp. and *Vriesea* spp. (including *V. noblickii, V. oleosa, V. scalaris*, etc).

This new species is named in honor of Chet Blackburn, who worked for seven years as editor of the Journal of the Bromeliad Society, from volume 46 (1996) to 52 (2002), and contributed through his editorial efforts to promote the increasing interest for Bromeliaceae all over the world.

Acknowledgments

The author thank Edmundo Ferreira Silva for his generous gifts of living specimens used in this work, as well as Raymundo Fernandes Reis Junior and José Carlos Martinez Falcon for their support and companionship during field activities in Bahia.

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Tillandsia x cuchnichim: A Natural Hybrid of *Tillandsia carlsoniae* and *Tillandsia eizii*

Virginia Guess and Robert Guess[1] **Photographs by Robert Guess**

Tillandsia carlsoniae L.B. Sm. and *Tillandsia eizii* L.B. Sm., epiphytic species of the subgenus *Tillandsia*, are readily identified by their distinctive inflorescences. Both species are endemic to oak and pine forests of Chiapas, Mexico, at elevations ranging from approximately 1500 to 2400 meters (Guess and Guess 1998). Since they flower at the same time and attract similar hummingbirds as pollinators, natural hybridization is likely to occur (Gardner 1984). In the last five years, we have examined the morphology of three plants that share the stunning traits of these species with some additional distinguishing characteristics. Following Benzing's (1980) approach on how to differentiate between an intermediate plant within a species and a true hybrid, we conclude the plants are natural hybrids of *T. carlsoniae* and *T. eizii*.

Tillandsia x cuchnichim R. Guess & V. Guess, hybr. nov. TYPE: Mexico. Chiapas: Municipality of Huixtán, near La Libertad, 1900 m, 24 Mar. 2002, *R. Guess & V. Guess s.n.* (Holotype: NY). FIGURES 16-20

Hybrida naturalis *Tillandsia eizii* L.B. Sm. et *T. carlsoniae* L. B. Sm. genita, inflorescentia digitatis decurvatis, petalis tubularis purpureis *T. carlsoniae* proximis, rosula erecta *T. eizii* simulans, et aliis characteribus inter parentes media.

Plant epiphytic, acaulescent, 81 cm (extended) in flower. ***Leaves*** in a dense rosette, covered with minute appressed scales. ***Sheaths*** elliptic, 12 x 7 cm, dark purple adaxially, and brown abaxially. ***Blades*** narrowly triangular, attenuate, 40-60 cm x 5 cm, lepidote. ***Scape*** 1.5 cm in diameter, decurved. ***Scape bracts*** foliaceous, densely imbricate, acute to attenuate, pink to green. ***Inflorescence***: 45 cm long, pendulous, densely digitate with 15 spikes. ***Primary bracts*** ovate, lepidote, vary from longer than spikes proximally to much shorter than spikes distally, rubescent. ***Spikes*** 12-15 cm x 3-3.5 cm, strongly complanate, densely lepidote. ***Floral bracts*** elliptic, acute, 4.6 cm x 2.5 cm, exceeding the sepals, ecarinate,

Figure 16. *Tillandsia xcuchnichim* in secondary-growth oak forest near San Cristóbal de Las Casas.

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densely cinereous-lepidote, rubescent. ***Flowers*** subsessile, 4-6 per spike. ***Sepals*** narrowly lanceolate, acute, 3.6 cm x 1 cm, carinate, glabrous, pale green with light yellow hue; two attached and one free. ***Petals*** 6 cm x .5 cm, naked, tubular, purple. ***Stamens*** exserted. ***Pistil*** 5.3 cm long, rounded in cross section.

Habitat

Hybrid is epiphytic, growing on oak tree in oak-pine forest of highland Chiapas.

Etymology

We selected the name *Tillandsia x cuchnichim* for this natural hybrid of *T. carlsoniae* and *T. eizii* to honor the Tzotzil-speaking Maya of highland Chiapas who have the responsibility of gathering certain flowers, including bromeliads, for use in the religious rites of their indigenous community. In Tzotzil, a Maya language, they are designated as "cuch nichim," those assigned to gather the required plants and flowers for ceremonies: "cuch" refers to responsibility or task, and "nichim" to flower. It was on such a collecting trip that one of these men first noticed what to him was a new and different flowering plant, and presented this bromeliad to us. The epithet is based on a word used in apposition, and therefore to be maintained according to Article 23.1 of the ICBN (Greuter et al., 2000).

Discussion

Our introduction to this *Tillandsia* hybrid occurred due to chance as well as familiarity with highland Chiapas flora. Twice a year a company of men from San Juan Chamula sets out in search of flowering *T. eizii* (FIGURE 21) for their religious rites. In March 1998, during such a collecting trip in the Municipality of Huixtán, one of the gatherers spotted an unusual bromeliad growing in an oak tree: a post-anthesis plant having a short, pendulous, digitate inflorescence with rubescent floral bracts. Observing that it was notably different from other bromeliad species, he brought the plant to our attention. In March 2002 and in the same forest, he collected another specimen that was of similar size and form but with a fresh inflorescence. This plant subsequently flowered and has produced three offsets. In April 2003, we found a third flowering plant in a secondary-growth oak forest in the Municipality of San Cristóbal de Las Casas at an elevation of 2,300 meters, approximately thirty kilometers from Huixtán in a straight line measurement (east to west).

All three specimens were alike in physical characteristics, flowered at the end of the dry season in April and May, and appeared to be natural hybrids of *T. carlsoniae* and *T. eizii*. Both species occur in the same highland forests where the hybrids were collected, also flower during the dry season, and attract the White-eared Hummingbird (*Basilinna leucotis*), the Magnificent Hummingbird (*Eugenes fulgens*), and the Green Violet-ear (*Colibri thalassinus*). The tillandsia hybrid combines the pink digitate inflorescence of *T. carlsoniae* with the pendulous inflorescence of *T. eizii*, being one-fourth to one-third the length of the inflorescence of *T. eizii*. The tubular purple petals of the hybrid are closer in color to those of *T. carlsoniae* than to the violet petals of *T. eizii*.

Offsets that are relatively fast growing may be one of the most important features of this hybrid. While *Tillandsia carlsoniae* (FIGURES 22, 23) also reproduces asexually, *T. eizii* rarely does. Based on our observations, seedlings of *T. eizii* grow at an incredibly slow rate attaining a size of less than ten centimeters over an eight year span (Guess and Guess 1996). We surmise that ten or more years are required before plants from seeds mature in their natural environment given the host trees are not destroyed in the interim. The increasing population of squirrels that feed on its succulent spikes is yet another threat to *T. eizii* (Guess and Guess 2000). Evidence of such predation also appeared on the third hybrid we examined which was missing one of sixteen spikes.

In addition to preserving the genetic make-up of *T. carlsoniae* and *T. eizii*, the knitting together of these two endemic species may have an additional advantage in the cultural fabric of highland Chiapas. That we have noted three similar hybrids in different forests indicates to us that hybridization may be occurring more frequently, and thus not an isolated event. Given time, *Tillandsia x cuchnichim* may well become a prized bromeliad used in rituals and for adornment throughout this region.

Acknowledgments

In 1998, we sent photographs of this *Tillandsia* to Bruce Holst and Harry Luther at Marie Selby Botanical Gardens. At that time, Harry Luther suggested it could possibly be a hybrid of *T. carlsoniae* or a new species, but needed more information to make a determination. Thanks to the astute observations of our colleague, Manuel Hernández Gómez, a cuch nichim of San Juan Chamula, we were able to locate two additional flowering specimens that confirmed our conclusions. We name the plant, *Tillandsia x cuchnichim*, with respect and appreciation to him and his compadres. We are most grateful to Jason Grant who advised us on the appropriate scientific ending for the name we chose, and provided the diagnosis in Latin; and to Dr. Jackie Kallunki, Associate Director of the Herbarium at the New York Botanical Garden Herbarium, who graciously accepted the holotype for their collection.

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Figure 17. Digitate and pendulous inflorescence of *Tillandsia x cuchnichim*.

Figure 18. Rubescent floral bracts and purple flower of *Tillandsia x cuchnichim*.

Figure 19. Inflorescence of *Tillandsia x cuchnichim* after anthesis.

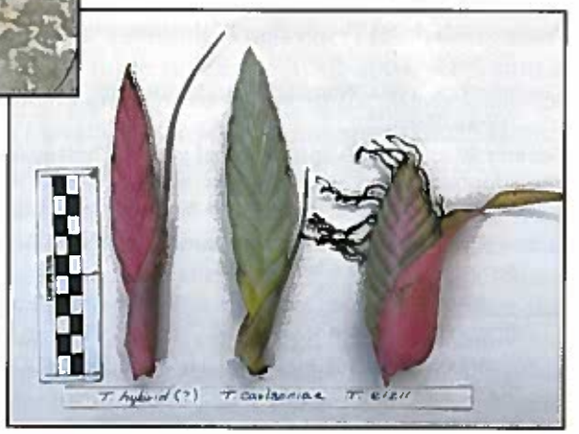

Figure 20. Spikes with primary bracts (post-anthesis) of *Tillandsia x cuchnichim*, *T. carlsoniae*, and *T. eizii*.

Figure 21. Flowering *Tillandsia eizii* in same forest as *T. x cuchnichim*, some 30 meters away.

Figure 22. Cluster of *Tillandsia carlsoniae* in situ.

Figure 23. *Tillandsia carlsoniae* in flower.

Welcome New BSI Directors

Francisco Oliva-Esteve—International (2005-2007). Born in Barcelona, Spain, Francisco has lived most of his life in Caracas, Venezuela, where he worked as an architect and landscape architect, designing and developing a number of public works such as parks, recreational areas, houses, botanical gardens, and urban master plans for several cities including the city of Caracas. His interest in plans has taken him to many remote areas of Venezuela, where he has photographed many rare species of bromeliads, and using those and others, has published three books on bromeliads: Bromeliaceae of Venezuela, Bromeliads, and Bromeliads III. Francisco has also authored many articles for the Journal of the Bromeliad Society based on his travels and discoveries. He has two species of bromeliads named for him, *Brocchinia oliva-estevae* L.B. Sm. & Steyerm. (=B. *tatei* L.B. Sm.) and *Lindmania oliva-estevae* L.B. Sm. & Steyerm. ex B. Holst.

Jay Thurrott—Florida (2005-2007). James (Jay) Thurrott has been employed with the City of Daytona Beach for more than 30 years as chief chemist and, most recently, as assistant manager for the water and waste water system. Jay has been growing bromeliads since the 1970s and, although not a charter member (he missed the first meeting), he has been a longtime active member of the Florida East Coast Bromeliad Society (FECBS) and representative to the Florida Council of Bromeliad Societies. Jay has served as secretary, vice president and president in his local society and is the current newsletter editor. Jay was one of the key planners and volunteers for Orlandiana, the 1996 World Bromeliad Conference. Also active in local garden club activities, he is past president of the Halifax Council of Garden Clubs (a council of 10 garden clubs in the Daytona Beach area) and currently is on their board of trustees. Jay grows more than 500 varieties of bromeliads in Port Orange and is presently working toward becoming a BSI accredited judge. Jay is a popular guest speaker at bromeliad societies; one of his most popular topics is growing the genus *Vriesea* in the landscape.

Moving?

If your address is changing, even if your move is a temporary or seasonal one, you should notify the BSI Membership Secretary four to six weeks in advance. Even when you are temporarily away, your bulk mail is either discarded by the Post Office or, as in the case of your JOURNAL issue, is returned to us at a postage due cost of .99 cents within the USA.

If you are moving, or have recently moved, please send your name, the old and new addresses, and the effective date to: John Atlee, BSI Membership Secretary, 1608 Cardenas Dr. NE, Albuquerque, NM 87110 or by e-mail to membership@bsi.org.

2004 World Bromeliad Conference Show Winners

Carolyn Schoenau, BSI Affiliated Shows Chair

Thirty-six exhibitors provided 264 entries in the hobbyist category and 64 entries in the artistic category; two exhibitors provided 28 entries in the commercial category. As you might imagine, the judging for top awards was competitive and difficult for the judges. The final outcomes are shown below:

Mulford B. Foster Best of Show (hobbyists): Frank Hayen from Woodland Hills CA for *Tillandsia cretacea*. Paul Wingert from Farmington Hill MI won Sweepstakes.

Morris Henry Hobbs Best of Show (artistic): Jackie Johnson from Rancho Palos Verdes CA for 'Let's Set The Town on Fire'; *Vriesea* 'Poelmanii' and *Tillandsia juncea*.

Mulford B. Foster Best of Show (commercial): DeRoose Plants from Apopka FL for *Guzmania* 'Olive'.

The division and section winner exhibitors are: George Aldrich, Nelwyn Anderson, DeRoose Plants, Larry Giroux, Frank Hayen, Jackie Johnson, Roger Lane, Marilyn Moyer, Carole Richtmyer, David Shiigi, Phil Speer, Barb Temchuk, Jay Thurott, Paul Wingert and Tom Wolfe.

See JBS 54(5), 2004 for photographs of some of these winners.

In Memoriam: Bea Hanson
October 1910 ñ February 2005

Murray Mathiesen[1]

Bea Hanson (FIGURE 24) was often been called 'The Mother of the Society' because she was the one who spent so much time organising the foundation of the Bromeliad Society of New Zealand. The inaugural meeting of the bromeliad fanciers was held at 57 Symonds Street, Auckland on July 24th 1962 and Bea became the first Secretary. For the next 22 years she served as Secretary, President and Vice President, and worked incessantly for the progress of the Society.

During 1963 the editor of the newsletter, which was sent to country members only, resigned and Bea took the job on, on a temporary basis. If 'temporary' lasts 25 years, what is a permanent job? The early 'News and Views' newsletter later turned into our present Journal format in 1972.

Bea was always very active in promoting and organising shows and displays and speaking on bromeliads at Garden Clubs. She was one of two members who organised the display at the Auckland Museum in November 1971 when our Society won the Auckland City Council Centennial Cup.

She often imported bromeliads from friends and growers overseas to help to keep us up to date with newer varieties. In addition, she posted plants out to country members for some years, yet still found time to write a beginners booklet called 'Bromeliads for Everyone' in 1970. This very popular book was reprinted several times.

In recent years frail health restricted Bea's active involvement with the Society but she still remained interested in all our activities. Bea was a true bromeliad lover, and she has given pleasure to literally hundreds and hundreds of people. We are so grateful for all her work for the Society and we will miss her greatly.

Figure 24. Bea Hanson.

Photograph courtesy New Zealand Bromeliad Society.

Photograph by Dave Anderson.

Figure 25. *Neoregelia* 'Bea Hanson'.

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50 Years Ago in the Journal...

Editor's note. Famed ethnobotanist Richard Evans Schultes contributed this single article on the genus Navia to the Journal of the Bromeliad Society, then The Bromeliad Society Bulletin. His excellent article was the first to introduce readers to Navia, a beautiful, though infrequently cultivated genus comprising approximately 100 species. An explorer extraordinaire, Schultes was responsible for the discovery of eight species of Navia, as well as scores more from other plant families. His work on the medicinal and ritual plants of the upper Amazon is legendary.

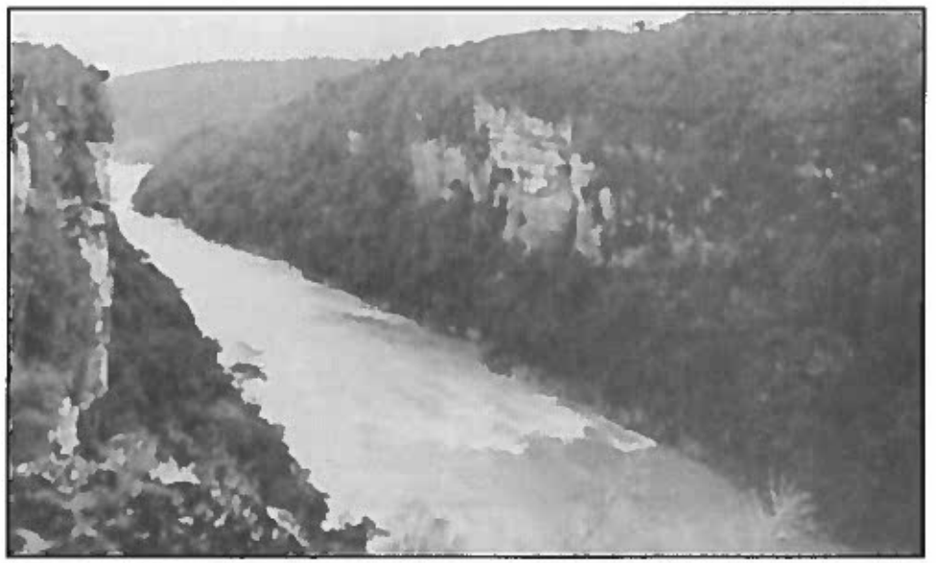

Photo H. Garcia Barriga.

Martius' westernmost collecting locality on the Caqueta River: Araracuara, Colombia. This is the precise locality from which the type material of *Navia acaulis* and *N. caulescens* var. *minor* was taken in 1820. Recently, a new species–*Navia Garcia-Barrigae*–was discovered on these cliffs.

Navia: An Ancient And Extraordinary Bromeliad Genus

Richard Evans Schultes, Curator, Orchid Herbarium of Oakes Ames, Botanical Museum of Harvard University, Cambridge, Massachusetts.

The sun has risen and the rains have fallen for countless thousands of years on the isolated sandstone mountains that stretch in a once-continuous arc from the Guianas, across southern Venezuela and into the Vaupés of eastern Colombia. These are either great massifs, as Mount Duida in Venezuela, or small mountains, as in Colombia, where erosion has fashioned a variety of grotesque domes and castles and battlements. Some have been washed away almost completely, leaving flat, sandy or quartzitic savannahs-islands of low open vegetation surrounded by a sea of tall dark jungle.[1]

These old mountains and their attendant savannahs are repositories of a flora of great interest because of curious adaptations to drought in an area of heavy rainfall. This savannah flora is also of far-reaching significance to botanists on account of its numerous primitive or rare species. Ecological and geological conditions conducive to the creation of endemism are at their best.[2] Well might we agree with a Colombian botanist who said: "These mountain witnesses of the Vaupés hold a secret. They cry out for study. They stand like age-conquering monuments."[3] The mountains in eastern Colombia are mainly of one of two forms–either long, tilted sandstone ridges or ledges with a sharp cliff on one side; or else eroded, rounded knobs or domes. All of these hills are nearly devoid of soil on the top, except in the frequent crevices or on slopes protected by overhanging crags. The tops of the ridges are usually of pure quartzite, and plants are forced to grow with their roots twisted and gnarled into cracks where rock-decomposition supplies minute quantities of sand. Yet it is surprising to find that there are really few spots devoid of vegetation. Everywhere, except on the somewhat wooded slopes, the vegetation is of a xerophytic nature. Representing elevated islands in the vast, flat Amazonian jungle, these mountains and hills receive about the same rainfall as does the surrounding forest, but little of the water can be retained. Immediately after the frequent cloudbursts, numerous picturesque cascades which drain the summits swell and, taking all sand and soil and decaying plant life with them, thunder down hundreds of feet to the creeks below. Where a gentle dip or swale does allow some water to accumulate, acidic conditions are so strong that the water is unavailable to plants, and a true physiologic drought prevails. The same is true of the low, sandy savannahs which frequently surround the base of these mountains or which represent the last vestiges of what was once a hill. Indeed, it might not be far wrong to describe these savannahs as deserts in the rainforest.[1]

Photo R.E. Schultes.

NAVIA CAULESCENS. Habit photograph at the type locality, LaPedrera, Caqueta River, Colombia.

As can be expected, the vegetation of these mountains and savannahs is sharply distinct from that of the surrounding jungle. It is related to the ancient

and, in many respects, primitive flora which is so peculiar to the great Guiana-Venezuela land-mass. The present distribution attests to the very great age of this flora. Many are the species, for example, which are known from two or three far-separated localities: the isolated hills of Amazonian Colombia and Duida, Roraima or other heights of Venezuela and the Guianas. And many are the genera of plants entirely limited to this arc of Cretaceous mountains. The curious bromeliaceous genus *Navia* is one of these endemics.[4]

One of the most primitive genera of the Bromeliaceae, *Navia* was discovered in Amazonian Colombia. In 1820, the famous German botanist-explorer, Karl F. P. von Martius, penetrated the unknown regions of the Caqueta or Japura River as far as the great Falls of Araracuara.[5] On the quartzitic mountains at Araracuara and at Cupati (now known as La Pedrera), he collected two species and one variety of *Navia*. Von Martius' manuscript description of the genus was published in 1830 by J. A. Schultes and his son J. H. Schultes, with that of *Navia acaulis, N. caulescens* and *N. caulescens* var. *minor*.[6] The two species were illustrated in 1894.[7] [Locality photo p. 201]

Since national boundaries in this wildest of jungle areas were not settled in 1820, *Navia acaulis* and *N. caulescens* have almost consistently been cited as from Brazil.[5] Nevertheless, they are Colombian. They have a rather wide distribution on these vestigial hills in eastern Colombia and have not yet turned up in Brazilian territory.

Navia acaulis, "lost" for 119 years, but rediscovered by the botanist Dr. José Cuatrecasas at San Jose del Guaviare in the Colombian Vaupés in 1939[8] and later by the writer in several localities[9], is a sessile rosulate plant without a stem and with a densely capitate inflorescence. Navia caulescens, collected for the second time at the type locality in 1912 by Ducke[10] and recently by the writer," has an elongated rhizome and an elongated, interrupted inflorescence. The former species grows in small groups of from

Photo R.E. Schultes (Courtesy, Bot. Museum of Harvard Univ.)

NAVIA SCHULTESIANA. A photo of the colony from which the type collection was taken at Mount Castillo, Colombia.

three or four to fifteen plants, close on bare sandstone under the most drastic conditions of heat and radiation; the latter clings precariously to overhanging ledges and crags which are often shaded and dripping. *Navia caulescens* almost invariably grows in close association with a very primitive sedge, *Cephalocarpus Dracaenula*,[12] which in habit and in morphology is so similar to the bromeliad as occasionally to cause confusion on superficial glance. *Navia caulescens* var. *minor*, quite in contrast to *N. caulescens*, forms very dense and compact cushions, often of as many as a hundred plants, and shows a distinct liking for exposed, sun-baked rocks.

Photo R.E. Schultes (Courtesy, Bot. Museum of Harvard Univ.)

NAVIA BICOLOR. Habit photograph, at Mount Chiribiquete, Colombia.

It was more than a century later that new collections from other parts of northern South America began to bring such an incredible number of species of *Navia* that the genus grew to its present size. Indeed, in one hundred years, only one addition to the genus was made. In his monograph of the Bromeliaceae of 1935, Mez[35] recognized only 6 species. Thus it is that, with 18 species and 3 varieties known today, the genus has tripled in size in a space of 20 years.

Baker described *Cryptanthus angustifolius* in 1889,[3] and Mez, seven years later, showed that the plant was, in reality, a *Navia*.[4] *Navia angustifolia*, a stemless species, was discovered by the explorer Carl F. Appun, in 1864, on Mount Marima, very near the famous Mount Roraima, in British Guiana. It has subsequently been found in the region of Kaieteur Falls by the botanists Sandwith, Maguire and Fanshawe "on the face of cliffs and under boulders at the summit of the precipices." A stiff, narrow-leaved, rosulate plant, *Navia angustifolia* is admirably adapted to withstand the drought which prevails in its chosen habitats.

In 1930, exactly one hundred years after the original description of *Navia*, the real and rapid extension of our understanding of the genus began with the work of Dr. Lyman B, Smith, now of the Smithsonian Institution. He recognized as an undescribed species of *Navia* a collection made by the British botanist, Dr. A. H. G. Alston, at Maceba Falls on the Karatung River in British Guiana. He named it *Navia Gleasonii*, in honour of Dr. H. A. Gleason of the New York Botanical Garden who, at that time, was working on the flora of the Colony.[15] *Navia Gleasonii* grows on moss-covered rocks in shade and is epiphytic on trees as well.

The following year, Smith described the first of a series of extraordinary endemic species of *Navia* from the world-renowned "Lost World" mountain, Duida, in southern Venezuela. *Navia brachyphylla*,[16] first collected in 1929 by the explorer Tate, and later, in 1944, by Steyermark on the summit of Duida, grows in dense tufts and has strange short, stiff, sometimes sickle-shaped leaves with all appearances of a highly adapted xerophyte. Five other species have subsequently been described by Dr. Smith from this rich repository of endemics, Duida. *Navia duidae*,[17] like *N. brachyphylla*, has leaves which are very dark green above and silvery or whitish beneath, and it inhabits the crests and slopes from 4000 to 6300 feet; its variety *glabrior*[18] occurs at lower elevations. Another species, restricted to moist bluffs at about 5000 feet, is *Navia Steyermarkii*,[19] named in honour of its collector, Dr. Julian A. Steyermark of the Chicago Natural History Museum. Still another odd species is *Navia xyridiflora*,[20] which Steyermark collected on dry slopes as a sessile terrestrial plant with strong, coriaceous leaves. *Navia glauca*, from the very summit, has curious leaves which are bluish green or greyish green on the upper surface, a truly unusual condition. Certainly one of the most distinct species is *Navia aurea*,[18] which Smith described from a collection made by Steyermark in dry crevices of bluffs at about 4000 feet; it is a small plant with extremely fine, many-ranked leaves adorned with white cobweb-like hair and, excepting for one Colombian species, seems to be unique in the genus in having yellow flowers.

Interesting novelties have turned up recently in Dutch Guiana, the eastern-most end of the arc of "Lost World" mountains. *Navia Maguirei*,[21] named by Smith for its collector, Dr. Bassett Maguire of the New York Botanical Garden, is set apart at once by its large, subpetiolate leaves and its connate sepals. *Navia Maguirei* var. *minor*[22] is a smaller form of this same concept. Both are native on dry cliffs and escarpments of Tafelberg (Table Mountain) in Dutch Guiana[23] and have not been found elsewhere.

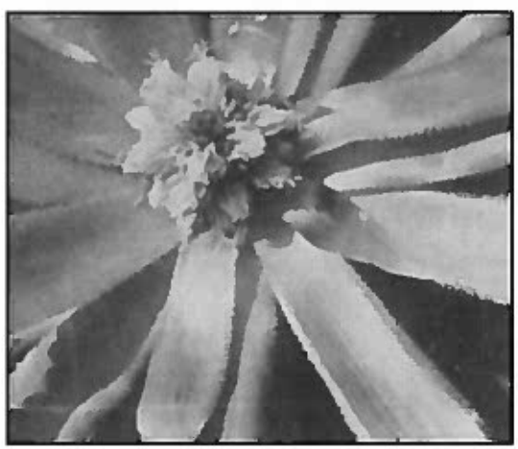

Photo from Kodachrome by R.E. Schultes.

NAVIA HELIOPHILA.

In 1948, the writer and his Colombian assistant, Sr. Francisco Lopez, penetrated the unknown Dimiti River, an affluent of the upper Negro River in Brazil, as far as Mount Dimiti. Dimiti is apparently a western outlier of the great chain known as Sierra Tapicapeco, belonging to the Guiana-Venezuela land-mass and running along part of the boundary between Brazil and Venezuela. From the peak of Dimiti, perhaps 2500 feet in height, a most bewildering and tantalizing maze of much higher and massive peaks can be seen to the northeast. These are botanically completely unknown, and they promise to yield untold treasures of plant life to those lucky enough to tread their trackless heights. There are most certainly new and strange species of *Navia* hidden away in these mountain vastnesses. Dimiti rewarded Schultes and Lopez with two magnificent species which Smith described as *Navia Lopezii*[24] and *N. myriantha*.[25] *Navia Lopezii* grows individually on humus-soil amongst littered rock fragments and under a light scrubby vegetation that affords, some shade throughout the day. Its leaves are more membranaceous than is usual, and the flowers are twice the size of those of any other known for the genus. Navia myriantha, so named because of the great number of tiny flowers in its dense inflorescence, is obviously more xerophytic in its structure than *N. Lopezii* and, to be sure, grows on bare rock-ledges which are exposed to the sun. Alone with *Navia Lopezii*, it has leaves the margins of which are not toothed. In almost all other respects, the two are very different as a glance at the plate on p. 28 will show. It is significant that *Navia Lopezii* and *N. myriantha* are the first and only species to have been collected in Brazil.

Mount Duida, with its 6 endemic species and 1 variety of *Navia*, must be considered, so far as our present publication permits us to judge, as one of the most important single localities for speciation in the group. Nevertheless, Amazonian Colombia is rich in species and varieties and in bizarre adaptations. Up to the present time, the vestigial hills of this area have yielded 9 species and 2 varieties, all of them endemic to Colombia. Thus, more than fifty percent of the genus, as it is known today, is strictly Colombian.

In addition to the original concepts of *Navia* (*N. acaulis, N. caulescens* and *N. caulescens* var. *minor*), the ancient hills of the Vaupés and Amazonas of Colombia harbor the following species and varieties: *N. bicolor, N. fontoides, N. Garcia-Barrigae, N. graminifolia, N. heliophila, N. Lopezii* var *colombiana, N. reflexa* and *N. Schultesiana*. So far as we know, each of these recently described species is endemic to one mountain, but this is not true of the three original concepts, each of which has turned up on several of the massifs.

Navia bicolor[26] a stemless plant with stout, stubby leaves, has the habit of *N. acaulis*, with which it grows. It strikes the eye immediately, however, as something distinct because of the sharp contrast between the dark green and glabrous upper surface of the leaves and the minute, soft, whitish felt on the under side, a character to which Smith refers in the specific epithet. An extreme xerophyte, it is known only from Mount Chiribiquete in the headwaters of the Apaporis, where it was collected by Schultes and the Colombian botanist, Sr. Gabriel Gutiérrez, in 1943 and 1944, respectively. In 1943, a neighbouring mountain–El Castillo–yielded the grotesque *Navia Schultesiana*,[27] which grows in dense and sometimes rather extensive clumps or cushions. The leaves are awl-shaped and finely toothed, and, from a distance, the plants give the impression of closely packed clumps of large mosses. According to Smith, this species is most closely allied to *Navia acaulis*. One would hardly suspect such a relationship, because, with its cushion habit, its more numerous and much narrower leaves and its

smaller flowers, it has a very different aspect. At home at an altitude of 1000 feet, it grows under overhanging crags in partially damp areas, where only the late afternoon sun reaches it. Like *Navia aurea*, it has yellow flowers.

The same expedition to the upper Apaporis basin which yielded *Navia acaulis, N. bicolor* and *N. Schultesiana* resulted[23] in the discovery of another striking species: *N. graminifolia*.[28] This extraordinary xerophyte, growing in large mats which carpet the flat sandstone top of Chiribiquete, has dense, stiff, needle-like, rosulate leaves. It is allied to *Navia Steyermarkii* of Duida. More recently, the mountains of the middle course of the Apaporis River have added to the wealth of *Navia*. So many species have come out of the Apaporis and its affluents that this area must be considered, along with Duida, as a primary centre of diversification of the genus. *Navia heliophila*,[29] a brave little species that clings to sun-baked cliff-walls of the chasm below the awe-inspiring Falls of Jirijirimo, resembles most closely its far-isolated cousins, *N. angustifolia* and *N. xyridifolia* of British Guiana and Venezuela, respectively. *Navia fontoides*,[30] on the contrary, is at home on shaded and wet cliffs along the Apaporis and its affluents. It is most abundant in the dark chasms at the great horseshoe-shaped Falls of Yayacopi, below Jirijirimo, but it has also been seen or collected at Jirijirimo and on the Kananari and Popeyaca Rivers. Of the most striking grace and beauty, *Navia fontoides*, alone in the genus, has either bright orange or scarlet floral bracts which, peering out through the dense, drooping rosette of dark green leaves, dot the dark, moss-covered cliffs with delightfully conspicuous points of colour. Mount Isibukuri, a great sandstone massif near the confluence of the Apaporis and Kananari Rivers and not far from Jirijirimo, has given us, in addition to *Navia caulescens* and *N. caulescens* var. *minor*,[9] a little plant of rare beauty. This is *Navia Lopezii* var. *colombiana*,[31] a delicate white-flowering variant of the rose-purple *N. Lopezii* of Brazil. The variety from Isibukuri has floral bracts which are purple outside and pinkish or yellowish inside, a colour scheme which lends rare charm to this small epiphyte that hugs the shadiest corners of damp, moss-and *Selaginella*-clad sandstone cliffs half way up the side of this 2100-ft. mountain. Not only are the new and virgin localities of eastern Colombia yielding up their botanical treasures in *Navia*; some of the classic localities are still rewarding the inquisitive botanist. When the aeroplane in which the Colombian botanist, Dr. Hernando Garcia-Barriga, and the writer were flying was forced down at Araracuara in December, 1951, an opportunity was unexpectedly offered of visiting the exact spot where Martius had made his rich collection of savannah plants in 1820. One of the surprises awaiting these botanists at this, the type locality of *Navia acaulis* and *N. caulescens* var. *minor*,[9] was a new species which Smith called *N. Garcia-Barrigae*:[32] a stemless, rosulate plant which, upon flowering, attains a height of more than thirty inches. This was, indeed, something strange and new in *Navia*! But *Navia Garcia-Barrigae* does not represent the largest in the genus, for, along with this species, Smith described *N. reflexa*,[33] a much more robust plant with an even taller inflorescence up to about a yard in length. *Navia reflexa* was found by the writer and Lopez in 1947, in a white-sand savannah at San Felipe on the Colombian bank of the Negro River, just below the confluence of the Guainia and the Casiquiare Rivers. This is the very spot which the great

English botanist-explorer, Richard Spruce, worked assiduously in 1851 and which has been the scene of more transient collecting often in the intervening century. *Navia reflexa* is abundant in the one savannah from which it is known, but the very fact that it evaded botanical eyes for so long would indicate that it is, like most of the other species, a highly restricted endemic.

Perhaps the time is not yet ripe for a monograph of this strange and fascinating genus. New explorations which are penetrating ever deeper into the massifs of northern South America are certain to bring back novelties which may be even more bizarre than some of those already known, and morphological investigations of the curious internal roots of the "stem" of *Navia* have just been initiated.[34] The most recent synoptic treatment, that of Mez,[35] who suggested that *Navia* might be a link between the Bromeliaceae and the Rapateaceae, dates from 1934, yet, with its 6 species, it is already obsolete. A modern summary of *Navia* is one of the absorbing contributions which we can expect from the pen of Dr. Lyman B. Smith, when he feels that explorations have reached a stage where such an undertaking is worthwhile–possibly within the next decade. Another exciting contribution will be the introduction into cultivation of some of the members of this quaintest and most singular of bromel genera.

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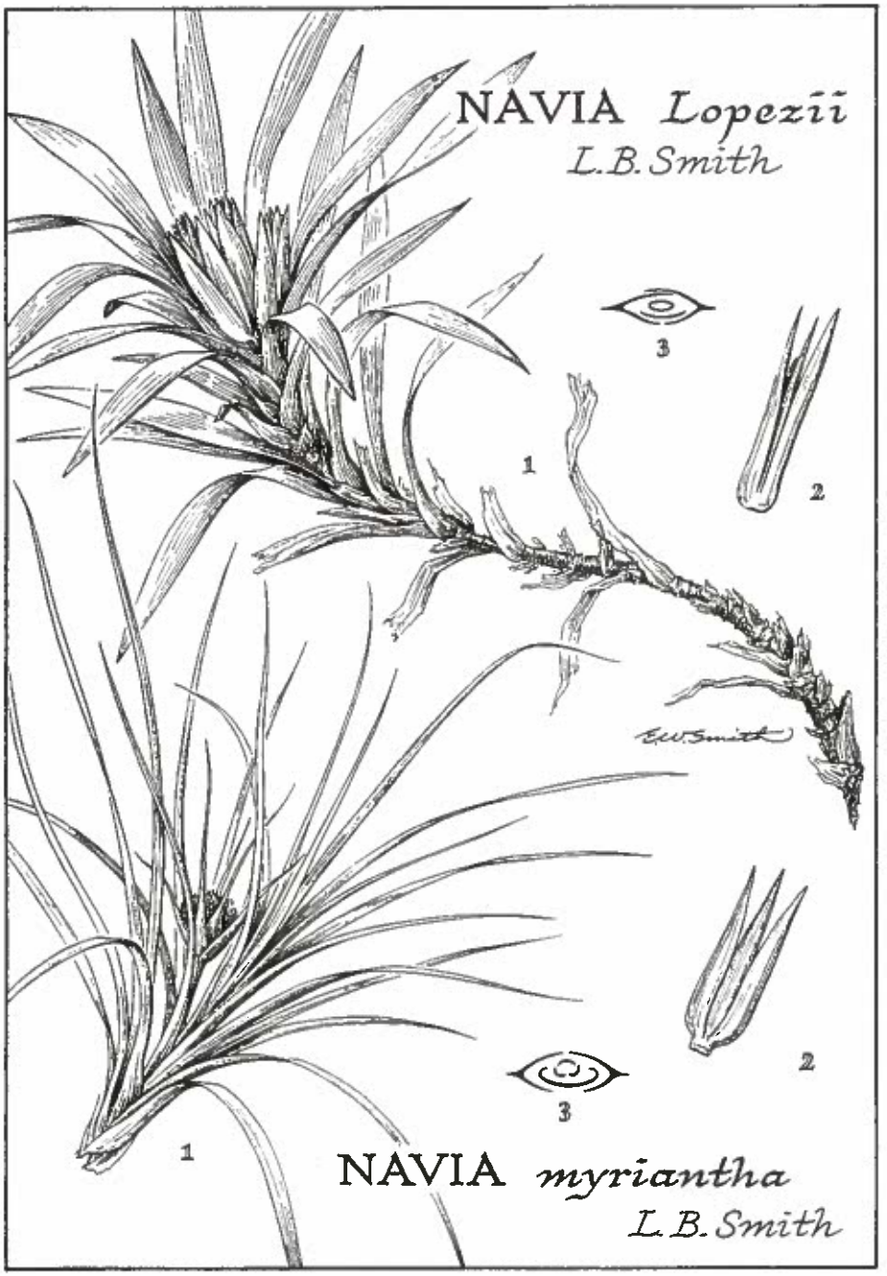

NAVIA LOPEZII. 1) Habit, 1/2 natural size; 2) flower, natural size; 3) schematic cross section of flower, about 1 1/2 times natural size. NAVIA MYRIANTHA. 1) Habit, 1/2 natural size; 2) flower, 5 times natural size; 3) schematic cross section of flower, about 10 times natural size. Drawn by E.W. Smith (Plate, Courtesy of Botanical Museum of Harvard University)

Not a *Navia*, Not Even a Bromeliad!

Bruce K. Holst, BSI Editor

Six years after having been discovered by Richard Evans Schultes in 1948, Lyman Smith studied this plant and assumed it to be yet another beautiful new species of *Navia* to add to burgeoning genus. However somebody forgot to count the number of stamens! All bromeliads have 6 stamens, but this one had only three. Moreover, it completely lacked trichomes, another trademark of the family. Only in its habit, did it resemble some of the other species of *Navia* that were known at the time. It wasn't until 1984 that Julian Steyermark and Paul Berry took a closer look at this species, and discovered that it actually belonged to the family Xyridaceae (Yellow-Eyed Grass Family) and that it represented a new genus for science. They named it *Aratitiyopea* (FIGURES 26, 27) for one of the mountains where it is found, Cerro Aratitiyope. Also once thought to be exclusive to the sandstone mountains of the Guayana Shield, this species has recently been discovered in Peru. Bromeliad or not, I'm sure many of us would like to grace our own collections with this beautiful species.

Figure 26. *Aratitiyopea lopezii*, a *Navia* mimic is actually from the Yellow-eyed-grass family, the Xyridaceae.

Photograph by Lisa Campbell.

Figure 27. Freddy Chacin (left) and Antonio Idiyu from Radual del Danto, Venezuela, revel in the discovery of *Aratitiyopea lopezii* from Cerro Sipapo in southern Venezuela, in 2000.

Photograph by Lisa Campbell.

Events Calendar

AUSTRALIA

June 11-12, 2005. *BSQ & CSSQ SHOW AND SALE.* The Bromeliad Society of Queensland, Inc. and the Cactus & Succulent Society of Queensland, Inc. Mt. Coot-tha Botanic Gardens Auditorium, Brisbane, Australia. June 11, 8-4:30; June 12, 9-3. Over 1000 different types of bromeliads, cacti, and other succulents will be available for sale. Entrance $3, children free. For more information, contact www.bsq.org.au.

September 8-11,2005. *CENTRAL COAST NSW BROMELIAD SOCIETY SHOW*, Held in conjunction with the Flora Festival which is a very big show featuring all things horticultural. Central Coast New South Wales Bromeliad Society. Kariong. For more information, contact fayhagen@tac.com.au.

September 10-11, 2005. *ILLAWARRA BROMELIAD SOCIETY SHOW.* Uniting Church Hall, Russell Street, Corrimal.

Oct. 14-17, 2005. *BROMELIADS XIII - AUSTRALIAN CONFERENCE.* The Bromeliad Society of Queensland, Inc. Brisbane, Australia. The conference will include lectures, tours, sales, displays, and an auction and show. For more information, contact Bromeliads XIII Conference Committee, c/o Bromeliad Society of Queensland Inc., PO Box 565, Fortitude Valley, Queensland, 4006 Australia. E-mail: secretary@bsq.org.au. Web site: http://www.bsq.org.au/conference.html.

October 30-31,2005. *BROMELIAD SOCIETY OF NEW SOUTH WALES SPRING SHOW.* Bromeliad Society of New South Wales. 9-11 Wellbank Street, Concord.

UNITED STATES

June 10-12, 2005. *36TH ANNUAL STANDARD BROMELIAD SHOW AND SALE.* Bromeliad Society of Houston. New location this year: Mercer Arboretum & Botanical Gardens, 22306 Aldine Westfield Road, Humble, Texas, USA. June 10, sales 12-5, June 11, sales 9-4, show 1-4, June 12, show and sales 11-4. For more information, contact Allyn Perlman (713-772-7831 or deliboys@houston.rr.com), www.bromeliadsocietyhouston.org.

August 6, 2007. YEAR 2005 BROMELIAD SHOW & PLANT SALE. South Bay Bromeliad Associates. Rainforest Flora Nursery, 19121 Hawthorne Blvd., Torrence, California, USA. August 6, show 12-4:30, sale 10-4:30; August 7, show & sale 10-4:30. Admission and parking free. No entry fee to show plants. For more information, contact Bryan Chan, 10571 Odessa Ave, CA 91344 (818-366-1858 or bcbrome@aol.com).

October 14-16, 2005. *CALOOSAHATCHEE BROMELIAD SOCIETY 2005 STANDARD BSI SHOW & SALE.* Terry Park, 3410 Palm Beach Blvd., Ft. Myers, Fl. Oct. 14, registration and exhibit entry; Oct. 15, open to public 9-5; Oct. 16, 10-4. For more information, contact Diane Molnar at (239) 549-3404 or capebrom@aol.com and Brian Weber at (941) 355-2847 or brianweber1b@aol.com respectively.

October 22, 2005. *FLORIDA EXTRAVAGANZA.* Florida Council of Bromeliad Societies. Sarasota Garden Club, 1131 Blvd. of the Arts, Sarasota, Florida. A banquet and rare plant auction to benefit the FCBS will follow at the Helmsley Sandcastle, 1540 Ben Franklin Dr., Lido Beach, Sarasota, Florida. Free Admission. A special room rate of $79-$99 is available. Call 941-388-2181. Proceeds to benefit the FCBS. For more information, contact Inez & Len Dolatowski - ldolatow@tampabay.rr.com.

Bromeliads in Afghanistan!

Ron Parkhurst[1]

My friend, Abdul Gardezy (FIGURE 28) from Kabul, Afghanistan recently visited our nursery on Maui. With his country's infrastructure being rebuilt, agriculture is important to feeding its people, and horticulture is important to the greening of its landscape. Most of the country is arid, though with some pockets of green oases. The rural areas are ahead, in a way, by being efficient in self-survival and by enjoying a simple way of life (FIGURE 29). On the other hand, modern construction dominates the urban scene (FIGURE 30).

Abdul hopes to highlight bromeliads in the urban scene in a new office complex he is building in Kabul and believes he will be the first person in the country to use bromeliads. Maybe the start of a new Afghan Bromeliad Society? Bromeliads are truly becoming known around the world, even in the most remote regions.

Figure 28. Abdul Gardezy with a *Neorgelia cruenta* var. *variegata*.

Figure 29. A small home and garden shop in Afghanistan.

Figure 30. Modern construction dominates some areas of Afghanistan.

[1] Olinda, Maui, Hawaii.

[1] BSI Secretary

The Bromeliad Society International

The purpose of this nonprofit corporation is to promote and maintain public and scientific interest in the research, development, preservation, and distribution of bromeliads, both natural and hybrid, throughout the world. You are invited to join.

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Figure 31. (Back Cover). *Tillandsia walteri* with conspicuously waxy leaves, growing alongside a Mormom Tea (*Ephedra* sp.) in the mountains of Peru. See Leo Dijkgraaf's article inside on this and other bromeliads from Peru's sacred valley.