

# BROMELIANA

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## BROMEL DIVERSITY

by Herb Plever

In a large population of any species in habitat, there will be found significant variations in color, size and shape between and among individual plants. Some of these variations are physical responses to changes in conditions which may occur, especially at the peripheries, but some variations may also be genetic with actual changes in the plant's DNA. In other words, their seedlings also would demonstrate the same variations from the "norm" as their parents displayed.

This should not be surprising in the context of the evolutionary history of family *Bromeliaceae* that Dr. David H. Benzing calls "An Adaptive Radiation". Bromeliads are very adaptive and are prone to respond to changes in their environments. Mutations can come about in a myriad ways and from many causes, many still unexplained. It is easy to comprehend the effect that the sudden uplifting of an ocean floor to create a mountain would have on a former low

altitude population of bromeliads. The DNA in some plants may in part be unstable; under the right circumstances, even more subtle changes in their environment might trigger mutations of their DNA.

Recall Len Colgan's December 2010 article in which he found diverse petal colors on *Tillandsia streptocarpa* and *T. duratii* in their habitats - **some growing on the very same tree**. Adaptive responses to what stimuli? In his Galapagos Islands studies Darwin found rapid adaptive changes in the shapes of birds' beaks in response to environmental changes.

Note the photos below of *Tillandsia lorentziana*. The white flowered form is found throughout South America, but the plant with purple bracts and blue flowers with white apices is rare both in nature and in



*Nidularium innocentii* v. *innocentii*  
(Grown under lights. See page 2)



*Tillandsia rectifolia*  
(*T. ionantha* x *schiedeana*)



*Tillandsia lorentziana*



*Tillandsia lorentziana*  
blue flowers

**NEXT MEETING** - Tuesday, May 3<sup>rd</sup>, 2011 **promptly at 7:00 P.M.** at the [Ripley-Grier Studios 520 8th Ave. \(between 36th & 37th St\) Room 16 N](#)

**THE PLANTS YOU ORDERED** - We'll recommend to each member the best place and best cultural techniques to grow those plants. Please bring in plants for Show and Tell and for sale.

***Reminder: you must come and pick up the plants you ordered at this meeting!***

cultivation. However, most variations that we encounter are not from genetic changes; our adaptive bromeliads respond to a change in environment by changing color, size and shapes. If you move them back, they will readapt to their former selves. Our



*Cryptanthus* 'Strawberries Flambe'



*Cryptanthus* 'Strawberries Flambe'

broms are also quite promiscuous; many species readily mate with adjacent or nearby different species. This tendency explains the large number of recognized natural hybrids such as *Tillandsia rectifolia* (photo on page 1), a natural hybrid of *T. ionantha* x *T. schiedeana*.

Among the important factors that influence the “look” your plants will have are light, fertilizer and the acidity (or lack of it) of your water and planting medium. Stronger light will make for better growth, color and markings and tighter conformations in most plants, but it can also wash out the red color in the leaves of plants with discolor leaves as in hybrids such as *Aechmea* ‘Foster’s Favorite’ and similar cultivars. The character and quality of the light will also affect the “look”.

Many plants that I grow under fluorescent lights develop what I consider to be better color and markings than they do when grown in my unobstructed south window. For instance *Nidularium innocentii v. lineatum* develops very white lines when grown under fluorescent lights, but yellowish-cream lines under natural light. (See photo on page 1.)

All of my *Cryptanthus* show better markings when grown under lights (see photos of *Cryptanthus* ‘Circuit Breaker’ on page 3 and *C. ‘Strawberries Flambe’* on this page. As can be seen from the photos of *Billbergia* ‘Strawberry’ and the dark form of *Neoregelia* ‘Spot On’ on page 3, some high light cultivars also develop more intense markings under lights than they do in my south window.

I don’t grow from seed; all of the plants shown are



*Cryptanthus* 'Strawberries Flambe'



*Cryptanthus* 'Strawberries Flambe'

vegetative progeny. They may be many generations removed from their parent, but still they are all progeny of the same original parents. See the photos on this page of *Cr. ‘Strawberries Flambe’*. The original parent that I

purchased was similar to the plant shown at the top left many years ago. It had significantly narrower leaves than one of its progeny in the adjacent photo that was grown close under fluorescent lights with a weekly high strength fertilizer. That plant has intense color and a beautifully compact conformation.

I have recently pumped up that fertilizer regimen for my Crypts with foliar feeding plus pouring fertilizer into the mix. The plant shown below it on the right is a progeny of the plant above, several generations removed. It received the stronger fertilizer regimen and perhaps was not grown as close to the fluorescent lights. As a result it has as broad but much longer, more spreading leaves that make a diameter of 15 inches! I think that the increased fertilizer regimen may be too much of a good thing. The plant is too large and I may cut down on the regimen for its pups to bring it back to the tighter shape of the plant on the top right.

Contrast that plant with the *Cryptanthus* ‘Strawberries Flambe’ at bottom of the column on the left. It was grown in the far corner of my south window. All of the plants in this area are rosettes that receive weekly fertilizer in their cups, so this *Cryptanthus* ‘Strawberries Flambe’ received fertilizer only when I remembered to find a sprayer to foliar fertilize it. It has decent but not great color, but its many, shorter leaves create a compact conformation. It is not as dramatic as

its siblings grown under lights.

Most pups are like their parent, but in some cultivars as in this hybrid (*C. ‘Diverse Pink’* x *C. ‘Cascade’*) can produce offsets with tendencies to



*Neoregelia* 'Spot On'



*Billbergia* 'Strawberry'



*Cryptanthus* 'Circuit Breaker'

to produce leaves of diverse colors and shapes, widths and lengths. They may also differ in how they react to the quality and strength of the daylight or fluorescent light they receive. I'd like to repeat that perfect plant shown at the top right of page 2, but I might have to grow a number of pups to find the "right one".

I use a mix of fluorescent tubes with phosphers that produce color temperatures that ap-

proximate that of daylight. Some usually highlight plants attain more dramatic color when grown under those lights, 16 hours a day. In my good south window, I can't get anywhere near the intense color shown on the *Billbergia* 'Strawberry' and the *Neoregelia* 'Spot On' shown above. That is also true for the *Cryptanthus* 'Circuit Breaker' also shown here. It has more vivid, white cross bars than usual. □

## WHY DO SOME BROMELIADS NEVER FLOWER?

By Mulford B. Foster

(This article by the "Father of the Bromeliads" is reprinted from The Bromeliad Society Bulletin, V. 1, No. 3, 1951. He was BSI's first President and Editor. The Bulletin became the Journal with V. 21 in January, 1971.)

This is a sixty-four dollar question from California! Actually, of course, all bromeliads do flower, even if it takes them 150 years to attain that achievement, as in the case of *Puya raimondii*.

Most of us would prefer not to wait 150 years and so become a bit impatient when some of the species do not flower. One of the most provoking experiences is that certain species seem to flower regularly for one person or in one section of the country, yet, that same species may rarely ever flower in another area. Of course, there is a reason but we not be able to explain it. There are so many conditions that enter into this problem that no one can give the specific reason in each case.

We do know, however, that some species are much more tolerant than others to different growing conditions, such as light and temperature, and this problem often becomes one of local conditions.

Certainly, the water question is an important one and rain water is unquestionably the best, although not always easily obtainable. Water on the neutral to acid side is best, however many aechmeas, neoregelias, billbergias, etc. will tolerate water slightly on the alkaline side.

Vrieseas certainly want acid water and the ones that do best for me are those that I put outside in a shade house where they receive plenty of rain. Also, I always put vrieseas in osmunda alone, and almost all other bromeliads in an acid medium such as leaf-mold, german peat, osmunda and sand. I think that osmunda could be used for practically all bromeliads, but it should not be allowed to break down to a soggy "sweet" mass.

Look and feel the texture of your plants. If the leaves are stiff, spiny, spotted or covered with grey trichome scales, they will likely need much light and

air. If the leaves are glossy and thin as with most vrie-seas they will need more syringing, shade and protection from too many air currents.

Light hours, cool temperatures, dry spells, rainy moist seasons are all natural causes for having normal flowering seasons for the different species. However, any one of these conditions along with the improper chemical content of water or food may cause the plant to continue to grow year after year, produce offsets and otherwise appear healthy, but it may not produce flowers. Those problems are generally local and may or may not be affected by the grower.

For years, I myself have been unsuccessful in even growing *Guzmania musaica* in greenhouses. This species just doesn't like our conditions, water or situation. I thought it might altitude, but when I found it growing natively in Columbia at 4,000 ft. above sea level and then in another area ten feet about sea level, I decided that elevation was not the cause. But unfortunately, I have not found the answer for its unhappiness. So far as location is concerned it grows happily and flowers in St. Louis, Baltimore, Washington and New York.

I have some vrie-seas that I collected in Brazil eleven years ago. They continue to grow but do not increase in size nor do they bloom!

As a corrective suggestion I would say to try different potting mediums other than you are using now...different light, a new location in your greenhouse...a different procedure for watering, a different feeding mix. A change in any one or more of these conditions may...bring out flowering in your bromeliads.

Flowering of bromeliads can be induced in many cases by the use of certain gasses and chemicals. I have been working on this problem for several years. This past winter I made a startling observation, and I am hoping to give some definite information on this subject in the near future. But first certain planned experiments will have to be made. □

Editor's Note: Mulford Foster's article was written shortly after the founding of BSI in 1950. He was a keen observer of plant growth as it related to conditions both in habitat and in his new home in Orlando, but he was just beginning to experiment after many years spent collecting all over South and Central America. (He discovered or rediscovered more than 200 bromeliad species, and brought back many hundreds of plants.)

Other than Mulford's articles early on, there was a scarcity of written cultural information. But Mulford

hit on the key areas: light, acidity of water and plant medium and its porosity, moving air and fertilizing.

When I joined BSI early in 1961 there still was little horticultural material available, and there was absolutely nothing written about growing broms indoors. We had to learn the culture from scratch, killed many plants in the process and we are still gaining new insights and dropping old techniques through ongoing experiments and observation.

I believe the failure to use enough fertilizer is one of the causes of plants failing to bloom, especially if they receive strong light as in the South. Of course neoregelias largely predominate plant collections, and frequent or strong fertilizer will wash out color and markings in that genus. Still, we do not see many plants in bloom in the judged shows at World Conferences.

Mulford never reported on his experiments to induce bloom with gas and chemicals, but many of us picked up the idea and were successful in flowering our broms in time for shows. In the late 1960s and early '70s we had great success using Brombloi (betahydroxyethyl hydrazine), a chemical that I brought back from the Netherlands; I reported on this work in several articles in the Journal. Unfortunately, it was found that the chemical was suspended in a carcinogen and it was banned. Next we experimented with Florel, Ethrel and Ethophon with only mixed results. Then came the invention of ethylene pills which we are using with excellent results.

In New York we are lucky to have good water with a somewhat acid pH of about 6.2. (7 is neutral.) We have been using acid media such as peat moss and shredded cedar bark. Some experts have suggested we that we try to get our water pH down to an acid 5.6. I plan to add a little citric acid to my watering can to get our pH down and see what results occur.

To get moving air in an apartment requires open windows and electric fans, especially in the winter.

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