FLORIDA WEST COAST BROMELIAD SOCIETY

1954-2020

Celebrating over 66 Years in Bromeliads

fwcbs.org

June 2020 Newsletter

NEXT MEETING

Date: ~~Tuesday, June 2~~ CANCELLED

The FWCBS Board of Directors has cancelled our June meeting due to the ongoing health concerns associated with the coronavirus/COVID-19 pandemic and government guidelines for health and safety precautions. The Board will review the situation in June and make a determination about the July meeting.

LAST MEETING HIGHLIGHTS

LAST MONTH'S PROGRAM

There is no program to report for the May meeting because the meeting was cancelled due to the COVID-19 pandemic. Instead, this issue of our monthly newsletter features a summary of two previous, related talks. The first was by member Barret Bassick in May 2014 and the second one was by Dr. David Benzing in January 2010. Both presentations deal with the topic of the high adaptability of bromeliads that gives them the ability to evolve and fit into a range of habitats.

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Barret Bassick

At our May 2014 meeting member **Barret Bassick** gave a presentation titled *Bromeliads—Why They Thrive On Neglect (Some Adapted Strategies of Bromeliaceae*). This is a summary of his talk.

Bromeliads are perhaps the most adaptable of all plants, and they occupy many different types of habitats. They are found in temperate to tropical zones in habitats that include full shade to full sun, in deserts, wetlands and rainforests, at low altitude along sandy, dry beaches and at high altitude in misty settings. About 80 percent (%) are epiphytic, meaning they typically grow on other plants or objects merely for physical support or saxicolous, meaning they grow on or around rocks. The remaining 20% are terrestrial (such as *Ananas*, *Cryptanthus*, and most *Pitcairnia*) and grow in soil.

The four things bromeliads need to survive are air, water, light, and nutrients, and over eons they have adapted their form and function to obtain these efficiently. Epiphytic and saxicoulous bromeliads do not have well-developed root systems and rely on trichomes (i.e., scurf) in the form of scales or hairs on the leaves to obtain moisture and nutrients from air, rain, and debris that accumulate in their leaves. Trichomes are made up of long strands that collect moisture out of the air and pump it into the leaves through leaf pores (stomata).

Trichomes also function to close the pores to reduce moisture loss when the air is dry and to provide sun and heat protection.

All bromeliads have trichomes including those that have 'tanks' or cups (such as *Neoregelia*), which are formed by tightly bound leaves in the center top of the plant. Trichomes on tank–type bromeliads are located on the base of the leaves, while trichomes on non-tank type bromeliads, such as *Tillandsia*, are more elaborate and cover more or all of the leaves.

Plant shape is also a factor in water storage and uptake. Broad-leafed bromeliads such as *Neoregelia* can have large tanks where water and nutrients accumulate. Tubular-shaped bromeliads such as some *Aechmea* have smaller tanks and hold less water, and some of these might have more prominent scurf.

Tank structures in bromeliads not only gather water and nutrients, they support other life forms such as lizards, frogs, and insects. Even fish have been found in tanks of some bromeliads. While these creatures take advantage of the water in the tanks, their waste products provide nutrients to the bromeliads.

Tillandsias exhibit the most advanced form of bromeliad epiphytism; most have no leafy tanks, leaves and/or roots, and survive instead on moisture and nutrients extracted by trichomes. Stripped down to essential parts, *Tillandsia usneoides* (Spanish moss) is a good example of these highly evolved plants; they are the most widespread of bromeliads in the world and are even found in Tierra del Fuego.

Some bromeliads use crassulacean acid metabolism (CAM) photosynthesis to create sugars. CAM is a carbon fixation pathway that evolved in some bromeliads as an adaptation to arid conditions. This adaptation allows bromeliads in hot or dry climates to open their stomata (pores) at night when humidity might be higher rather than during the day, to reduce water loss. These tend to be slow-growing plants.

Other adaptations bromeliads have made to accommodate diverse growing conditions are leaf type, thorns and roots. Leaf type can be an indication of light requirements. Thicker and shorter leaves can mean the plant will tolerate abundant or full sun while thinner and longer leaves can mean the plant requires less light and more shade. Thorns are an adaptation some bromeliads have developed as a protective measure against being eaten. In epiphytic bromeliads, roots are not just for holding fast to a surface; they also function to take up nutrients and water when in soil.

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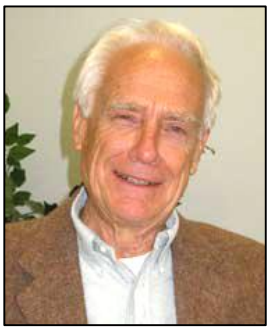
January 2010

At the January 2010 meeting, **Dr. David Benzing** gave a presentation titled *Adaptive Radiation of Bromeliads* using examples of bromeliads in the subfamily Tillandsioideae to explain how the evolution of bromeliad species allows them to adapt to new environments. This is a summary of his talk.



Dr. David Benzing

A New World plant, bromeliads are widespread and able to live in diverse environmental conditions due to their many adaptations. They evolved from a common, primitive ancestor to multiple and diverse species within a vast array of habitats.

Early *Tillandsia* bromeliads were grass-like, similar to the genera *Pitcairnia* and *Puya*, that is, they were without a tank or trichomes and had simple leaves on a short stem. Over time, they evolved into two main lines: one with tanks and one without tanks. Bromeliads with tanks form a tightly bound structure with their leaves that helps capture water and nutrients, while trichomes [scurf], in the form of scales or hairs, allow bromeliads to capture water when there is no tank and to reflect sunlight in desert environments.

Trichomes have played a major role in adaptation of bromeliads. Here are examples of five different adaptations of *Tillandsia* that evolved because they developed trichomes instead of well-developed tanks.

1. Extreme body size reduction: Spanish moss, *Til. usneoides*, is the ultimate example of this type; it is small in size (and the smallest bromeliad), has only three leaves, and has no internal cavities. It has a high surface-to-volume ratio (i.e., large external surface area compared to internal tissue volume), which yields a high rate of photosynthesis.
2. Extreme xerophytes: Tillandsias that live in very dry environments, such as *Til. Tectorum*, have abundant trichomes on their leaves. These types often have a low surface-to-volume ratio to reduce water loss.
3. Cloud forest: In the moist, misty environment of a cloud forest, Tillandsias have fewer trichomes because they have developed a hydrophilic surface, which is a leaf surface that attracts and bonds with water.
4. Caulescent lithophytes: Tillandsias that grow in or on rocks, like *Til. funkiana*, have a well-defined caulis (stem) and hang like curtains with long, pendant, un-branched limbs.
5. Ant-fed nutrition: Tillandsias, *such as Til. Bulbosa*, harbor ants in internal cavities, where their waste provides nutrition for the plant.

Dr. Benzing is an American botanist whose research and writings have dealt with the biology of epiphytes, primarily bromeliads and orchids. He taught biology and environmental science at Oberlin College in Ohio for over 40 years until he retired in 2006. He has worked with Marie Selby Gardens for over 30 years, spending winters in Sarasota, dividing his time between Florida and Ohio. In 2006 he joined the staff at Marie Selby Botanical Gardens and was appointed to the Jessie B. Cox Chair of Tropical Botany. He and the late Harry Luther co-authored the book *Native Bromeliads of Florida*, published in 2009. Another of his books is *Plants: Epiphytes and Aerial Gardens*, published in 2012. He currently serves on the Scientific Review Panel for the Journal of the Bromeliad Society International.

THIS AND THAT

Stigmatodon plurifolius

I have a bromeliad (picture on right) that was labeled *Vriesea plurifolia* when I acquired it. It is endemic to southeastern Brazil and I have not seen it in grown commonly in collections. After checking the New Bromeliad Taxon List (http://bromeliad.nl/taxonList.php?getCSV0) maintained by Derek Butcher and Eric Gouda, I learned this plant had been reassigned the name *Stigmatodon plurifolius*. This renaming was only one of many prompted by recent studies of bromeliad DNA and morphological features that resulted in a revision of the Tillandsioideae subfamily.

Stigmatodon plurifolius

To accommodate the new DNA data, 13 new genera were added and then filled with species from other long-established genera. *Stigmatodon* is one of the newly designated genera and has 13 species assigned to it. I suspect the species name was changed from *plurifolia* to *plurifolius* to meet the International Code of Zoological Nomenclature wherein the species and genus names must agree in gender.

I acquired the plant about seven years ago from Herb Hill when it was a little thing about 3 inches tall. I put it in a net pot with a very loose medium that I occasionally use for Tillandsias and hung it in a clump of paurotis palms among a number of Tillandsias, where it gets strong morning sun. It has been there ever since and seems happy; it is now over a foot long and has never bloomed. The picture on the right (Source: FCBS.org Photo Index), shows what the bloom will look like in the event it ever blooms. Derek Butcher (former BSI Bromeliad Cultivar Registrar) tells me that while the name sounds like that of a dinosaur, it only means that is has a stigma shaped like teeth. The name comes from the Greek words *stigmatis* plus *odon*, the latter meaning 'tooth', in reference to the tooth-like projections on the stigma lobe margins.

Stigmatodon plurifolius

Aechmea 'Blotches'

A picture in last month's newsletter mis-identified the plant on the left. It is Aechmea caudata 'Blotches'.

IN THE GARDEN THIS MONTH

Canistrum triangulare

Aechmea nudicaulis
'Frosty the Snowman'

Dave Johnston submitted the pictures below of bromeliads from his collection.

Neoregelia ’Andy Price’

Neoregelia ‘Cereza’ albomarginated

Guzmania ’Denise’

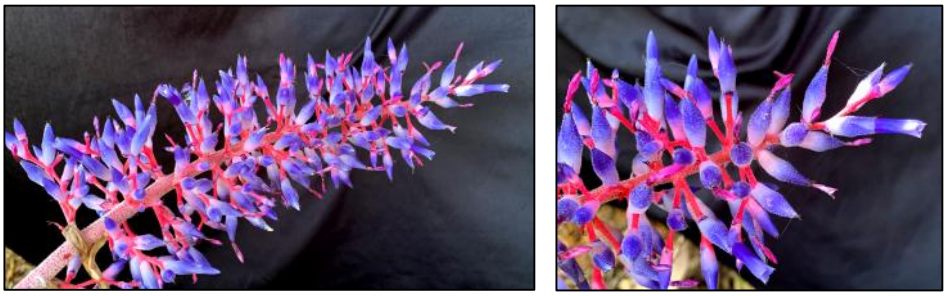
Neoregelia ’Charissma’

Neoregelia ’Pink Sensation’ x ’Cordovan’

Neoregelia ’Evan’

Gary Lund submitted the pictures below of bromeliads from his collection.

Aechmea mulfordii cv ’Malva’
Can be grown in the landscape in bright sun



Aechmea 'Del Mar'

Two *Hechtia guatemalensis*

UPCOMING EVENTS, 2020

It appears that all plant events such as shows and sales typically scheduled for spring and early summer have been cancelled or postponed. This section will be updated as more information becomes available.

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