

BROMELIAD SOCIETY OF

SAN FRANCISCO

MAY 2016



Meeting Specifics

When: Thursday, May 19

Time: 07:30 PM

Recreation Room

Where: San Francisco County Fair
Building
9th Avenue at Lincoln Way
San Francisco



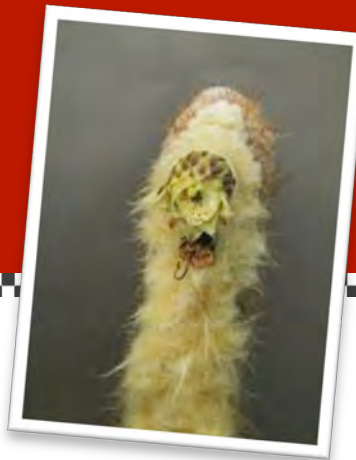
Exploring Ecuador:

Visions of Ecuadorian Flora and Fauna

Traveling West to East, from pacific lowlands of Guayaquil across the Andes to Amazonian highlands of Zamora, then South to North from dry hills of Vilcabamba to the wet forests surrounding Quito, we crisscross the country in search of bromeliads, orchids and other botanical treasures, with some interesting “close-encounters” of the avian kind. With 16 vegetative Eco zones, from mangrove marsh to montane cloud forest, and savanna to lowland Amazon basin; Ecuador is a nature photographer’s paradise. This presentation by **Gregg DeChirico** is a compilation of photos taken on two separate excursions across Ecuador, one made in June 2011, and again in January 2012; both organized by Guillermo Rivera and SouthAmericanNatureTours.com.

Gregg will be bringing lots of bromeliads for sale and also will be speaking to the San Francisco Succulent and Cactus Society on Tuesday, May 17th.

No one signed up for refreshments this month, but our members always come up with delicious goodies. Thanks in advance.



April Meeting

Gary Duke's talk covered Peruvian cacti, bromeliads and culture

Gary Duke, from southern California, gave us a talk on bromeliads that he saw on his trip to Peru with Guillermo Rivera. This talk focused on the plants he saw in northern Peru and was a continuation of his talk on plants in southern Peru on Tuesday night to the San Francisco Succulent and Cactus Society. Although Gary does not know much about

the bromeliad family, he attempted to identify each plant in the photos. Our society members were helpful in identifying most of the plants. Some of the tillandsias were growing on columnar cacti - a fact that amazed Gary.

Gary spent quite a bit of time in conveying the various habitats in which the plants grow; many of the bromeliads

were found at higher altitudes, but he also showed *Tillandsia palacea* growing in the sand along the ocean (in southern Peru).

Since Gary had grown up on a Midwest farm, he was interested in the terraced farms found throughout the country.

This is a tillandsia growing on the cliffs in Peru.

These farms were started by the Incas and remain much the same today.

He also showed slides of women from different villages where the hat a woman wears indicates the town she is from. The women's clothing was very colorful.

Gary also showed how a home constructed many years ago in an old cobblestoned village was undergoing very upscale renovations. The main entrance to the house was open to permit his photography.

Thanks, Gary for a comprehensive visit to Peru!



JUNE BROMELIAD SALE



Our combined plant sale with the San Francisco Succulent and Cactus Society (SFSCS) will be on **June 11th and 12th** this year at the County Fair Building. Setup will be on **Friday, June 10th** from 3 PM to 8 PM. We must be out of the building at 8 PM on Friday evening.

Sale schedule is Saturday (9am to 5 pm) and Sunday (9 am to 4:30 pm). Cleanup is 4:30 pm to 6:30 pm.

This is our main annual event that brings in money to support the society. Start setting aside your plants for the sale and save these dates to help on the sale. Since this is such an important event for our society, we really need as much support as you can provide. You can help in three ways:

1. Entering some of your premium plants in our bromeliad display area
2. Selling your own plants
3. Working at the show/sale.



Remember, if you plan to sell your plants, the club will keep 25% of the sales.

If you are selling plants at this sale Roger Lane will be the collector of your bar code requests. The form to request your price codes is attached to your newsletter this month. It will also be available at this month's meeting. Given the short time between our meeting and the sale, please submit your barcode requests ASAP. The barcode sheets have 80 items per sheet and you cannot mix items per sheet.



One of the conditions of selling your plants is helping out at the sale for a minimum of 4 hours during Saturday or Sunday. We need to help the SFSCS in various areas as well as working on our own sales.

Some of our members have more than one vendor id in the cash register system. If you are selling with barcodes from multiple ids, you may only use your bromeliad id in the bromeliad sales area.

There will be signup sheets at this month's meeting. This is our largest annual sale and we need your participation to make the sale a success.

Start saving boxes for the sale!

Tillandsia Culture, Habitats and Metabolism (Part 1)

It is amazing that so many tillandsias, coming from wet, arid, hot, cold, high and low habitats, have been able to be grown successfully indoors. To better understand tillandsia culture it is helpful to review some biological and horticultural basics. The primary source for the following material is the remarkable "*Biology of the Bromeliads*" (Mad River Press) by Dr. David Benzig - scientific, yet accessible to hobbyists.

All plants transpire moisture from their tissues through leaf pores called stomata. Terrestrial plants with roots in the soil can replace water lost by evaporation/transpiration. Epiphytic and saxicolous tillandsias with no central or leaf axil spaces to catch and retain rainwater have evolved a leaf covering of specialized trichomes, cells which can absorb molecules of water vapor and mineral ions. But they may dry out quickly because of **Water Vapor Pressure Deficit**. Even if you spray them with water, if the surrounding air is low in humidity there is a deficit between the drier air and the water saturated leaves, which causes rapid transpiration of the plant's water to the air through the stomata. In a cool room transpiration will be more rapid than when it is warm because the cool air cannot hold much humidity and the **WVP Deficit increases**. But in a room very warm from winter heating, humidity is evaporated and this also raises **WVPD** transpiration.

All living things have evolved mechanisms to fix carbon dioxide (CO₂) for the maintenance and growth of their cells. Organisms such as bromeliads feed themselves by harvesting sunlight and manufacturing nutrition from CO₂ and water. Green plants with chlorophyll pigments capture radiant light from the sun in the form of photons and use it to fix CO₂. The photon energy plus CO₂ plus H₂O is used to create chemical bonds between the carbon, hydrogen and oxygen atoms to form oxygen and carbohydrates such as glucose.

Bromeliads use two chemical methods to make food: C3 and CAM metabolism. In the former process, the stomata in the leaves of plants adapted to grow in water sufficient environments, called **mesophytes**, open during the daytime and closed at night. In the daytime, the mesophytic, soft-leaved pitcairnioids and tillandsioids collect CO₂ from the air, which is diffused through the leaf pores into the leaf interior to the green cells. With water this photosynthetic process of **C3 metabolism** produces sugar-food and oxygen.

C3 Bromeliads



Catopsis species



Tillandsia cyanea



Vriesea ospinea v. gruberi

When the stomata are open, oxygen escapes into the air. At night, when oxygen is needed in the leaf for respiration, it leaks through the closed stomata into the leaf and the CO_2 , which had been taken in earlier, is diffused out of the leaves through the same mechanism. The stomata do not make a 100% closure at night. However, the C_3 metabolic process, with its easy diffusion of gaseous CO_2 and oxygen also permits water loss through transpiration to a degree depending on outside humidity and **WVP**. That is why atmospheric and mesophytes without water reservoirs require constant high humidity to reduce the **WVPD** and to provide intake of water molecules.

Dark CO_2 Fixation with Crassulacean Acid Metabolism (CAM) is the mechanism with which xerophytic plants adapted to withstand drought perform photosynthesis. These plants usually have stiff, succulent, or sub-succulent leaves. During the daytime xerophytic tillandsias do not take in any CO_2 no matter how bright the light. The stomata become flaccid and remain closed during the daytime. Then, at night the stomata open and instead of giving off CO_2 as do the mesophytes, the xerophytes take in and store CO_2 by converting it into organic compounds such as malic acid. This requires much less energy than converting CO_2 into sugar. The chemical energy for organic acid synthesis is obtained by breaking down starch reserves into sugar and through respiration to CO_2 and H_2O . This energy then chemically bonds the absorbed CO_2 to a receiver PEP molecule that has also come from respiring sugar. After sunrise the stored malic acid is gradually degraded by enzymes and de-acidified, which liberates CO_2 into the leaf interior where it remains trapped because the stomata are closed. As sunlight reaches the plant, photosynthesis occurs, fed by regenerated CO_2 .

The amount of sugar manufactured by the CAM process is less than that produced by the C_3 pathway. But while they are less efficient at photosynthesis than mesophytes, xerophytes are far more efficient in using water, so the trade-off for succulent xerophytes is that they don't lose much water. The unusual photosynthetic difference between mesic and xeric plants classified within the same genus involving reversal of the opening and closing of leaf stomata has interesting implications for tillandsia genetics, evolution, and taxonomy.

CAM Bromeliads



Aechmea fasciata



Dyckia platyphylla



Tillandsia xerographica

The BSSF is a non-profit educational organization promoting the study and cultivation of bromeliads. The BSSF meets monthly on the 3rd Thursday at 7:30 PM in the Recreation Room of the San Francisco County Fair Building, 9th Avenue at Lincoln Way, Golden Gate Park, San Francisco. Meetings feature educational lectures and displays of plants. Go to sfbromeliad.org for information about our meetings.

The BSSF publishes a monthly newsletter that comes with the membership. Annual dues are single (\$15), dual (\$20). To join the BSSF, mail your name(s), address, telephone number, e-mail address, and check payable to the BSSF to: Harold Charns, BSSF Treasurer, 255 States Street, San Francisco, CA 94114-1405.

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BROMELIAD SOCIETY INTERNATIONAL

The Bromeliad Society International publishes the Journal bimonthly at Orlando, Florida. Subscription price (in U.S. \$) is included in the 12-month membership dues. Please address all membership and subscription correspondence to Membership Secretary Annette Dominquez, 8117 Shenandoah Dr., Austin, TX 78753-5734, U.S.A. or go to www.bsi.org.

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