BROMELIANA

PUBLISHED BY THE NEW YORK BROMELIAD SOCIETY
(visit our website www.nybromeliadsociety.org)

February, 2013 ***Volume 50, No.2***

ANOTHER GREAT HOLIDAY PARTY

by Herb Plever

On December 20th, Michael Riley and Francisco Correa once again graciously hosted our annual holiday party at their elegantly appointed apartment. As the date was close to Christmas, every one of the many rooms in the huge apartment had a yuletide theme - even the vestibule at the entrance door. There we were greeted by a whirling, dancing poinsettia which sang "We wish you a merry Christmas...", and by a Santa which climbed up and down on a rope suspended from the ceiling. (The apartment covers the entire first floor of the building.)

Michael & Francisco's living room epiphytic wall at Xmas

The fabulous epiphytic living room cork wall, with its multitude of mounted bromeliads, orchids, aroids, ferns, philadendrums, etc. served as a backdrop to a beautiful xmas tree with colored lights, plant decorations and ornaments. The plants on the cork receive frequent misting, and the floor is water-proofed to protect it from the water that drips down and is recycled. I noted that there was now a fourth pup from the original ***Aechmea* 'Ensign'** Michael had mounted on the cork wall many years ago, and it was in bloom.

Michael had his "potting shed" open for inspection. It is a room with a sink, banks of lights, work bench and lots of potting supplies, pups and small plants.

Of course the food was wonderful. Our charming hosts provided the main course, a tender smoked, spiral ham, salad, fruit, wine and booze, and our members brought great appetizers, side dishes and smoked salmon and chicken salad spreads and assorted cheeses, etc.

I became addicted to a bowl of black and green olives stuffed with garlic or chillies. The traditional 'Begley Family' pasta was brought this time by Evelyn and Theresa Begley.

Everyone had a grand time. There was so much conversation and cross-conversation about plants, politics, plays, music, etc. that we stayed until it was late and realized it was time to go home.

Michael grows species and cultivars from many plant families, as displayed on his wall. From the conversation I learned that many members grow orchids in addition to bromeliads. Some, like Carol, also grow cacti and succulents, gesneriads and begonias. Barbara and I seem to be the only ones who stick exclusively to bromeliads.

Our kudos and sincere thanks go to Michael and Francisco for their friendship and generosity and for making our holiday party an event to be remembered.

THERE WILL BE NO MEETING IN FEBRUARY

VAMPIRES, TILLANDSIAS - Things that Go Suck in the Night

by Andrew Flower

(This article by the former BSI Journal editor, is reprinted from the January 2013 issue of Pup Talk, newsletter of Saddleback Bromeliad Society. It originally appeared in the January 2002 newsletter of North County Bromeliad Society (CA) and was reprinted in the February 2011 newsletter of the San Francisco Bromeliad Society. I reprint it once again because I think it is singularly instructive for our members who don't merely water but soak their tillandsias. All the photos shown in this article are mine, of plants I grew and flowered indoors. Editor.)

One school of thought suggests that it does no harm to water Tilllandsias at night. This gives them many hours to absorb the water before the demands of the hot sunny days begin. Ostensibly, this "suggestion" is contrary to the oft-quoted advice to water Tillandsias in the early morning, or late afternoon provided they are dry by nightfall. So I think it is worthwhile commenting on this a bit further, since taken at face value such contrary advice can be confusing. As it happens, both pieces of advice are correct in particular circumstances.

Tillandsia atroviridipetala

The question of watering xeric (dry-growing - Ed) Tillandsias involves considering two of the primary requirements of plant life: carbon dioxide and water. The CAM (Crassulacean Acid Metabolism) business relates to the different way Tillandsias (and some other plants) actively take up carbon dioxide. A "standard" plant model, like most of your terrestrial types, takes in carbon dioxide though its leaves during the daylight and uses energy from sunlight to convert the carbon dioxide into a solid form of stored energy - mainly starches.

The huge problem with this process is the fact that as soon as a plant opens up the pores (stomata) in its leaves to pull in carbon dioxide from the air during the day, water vapor rushes out through the pores. This is bad news if you are a little Tillandsia sitting on a twig with no way to replenish the lost water through your roots, and on a hot day you would lose so much moisture you would just burn up and die.

So "air" Tillandsias were only able to evolve because of a different carbon dioxide-absorbing system, namely CAM respiration. The CAM plants do not take up carbon dioxide during the day; they wait until night. At night they lose **far** less moisture when they open their stomata because the ability of the air to suck moisture out is much less. (This is a function of the lower temperature and higher humidity - expressed as "VPD" or vapor pressure deficit of the air - which I won't go into here...)

So think of your Tillandsia as a little night-vampire, sitting there sucking carbon dioxide out of the night air. Throwing water on it at night time has a similar effect as throwing sunlight on old Dracula, because when the water-absorbing scales on the Tillandsia's leaves get wet, they flatten down and cover the stomata and the little chap is effectively suffocated.

Some people have heard (or even read) that bromeliads cannot stay wet for more than 24 hours. I think the real point is that Tillandsias cannot stay wet for 24 hours a day on a continuing basis, ad infinitum. Why not? Because they die of carbon dioxide starvation, for one thing.

I have an airtight plastic box into which I put Tillandsias, and I measure the carbon dioxide content of the air with an analyzer. When you put dry CAM Tillandsias in the box, the carbon dioxide content of the air decreases at night, as you would expect from the theory that they absorb carbon dioxide during the night. And during the day, the carbon dioxide content of the air INCREASES which you may not expect. What this indicates to me is that the Tillandsia is continually LOSING carbon dioxide, day and night, at a small rate (consistent with what you would expect from osmosis as the concentration of carbon


Tillandsia andreana


Tillandsia edithae

dioxide inside the plant's cells is greater than it is in the atmosphere).

So, the Tillandsia as a living form is continually "leaking" carbon dioxide, but during the night while it is actively taking in carbon dioxide, considerably more carbon dioxide comes in than goes out. In one experiment I soaked a number of Tillandsias in water for a couple of hours so they were well saturated, then put them in the plastic airtight box. During the night, the carbon dioxide content in the air again increased, and so on for several days. So apparently the plants were just losing carbon dioxide continuously and if left in this state they would presumably reach a point when the carbon dioxide concentration inside the plant cells was the same as the concentration in the air - not enough to sustain the plant.

trichomes before watering

trichomes after watering

Getting back to cultivation, the standard advice I give is to water your Tillandsias in the early morning, allowing them a couple of hours to at least absorb water before air temperatures start rising and drying the plants. This avoids the problems you will get if the plants are wet during the night when there are lower temperatures and higher humidity, hence little drying effect. There are going to be times when you have hot night temperatures and lower relative humidity (hence higher VPD) and then you can water the plants at night - knowing they will have some time to stay wet, but there is still sufficient drying capacity in the air to get them dry.

This story also tends to accommodate the situation observed in nature where xeric Tillandsias receive water from a night mist that comes down mid-way through the night. This early-morning wetting is going to still leave a period during the night hours when the plants are dry, thereby able to entrap carbon dioxide.

(Editor's note: This article points to cultural practices that may adversely affect the CAM metabolism process in Tillandsias. The two photos at the top of this page visually explain the reasons for morning watering. The photo to the left is a close up of *Tillandsia ionantha* in its normal growing condition before watering. It shows the raised trichome scales in a position to extract moisture and nutrients from the air and they do not cover the leaf pores. The photo to the right shows the plant after watering; the trichomes are flattened over the surface of the plant so that they cover the leaf pores. If the plant is watered or soaked at night when the leaf pores are open, the flattened trichomes cover and block the pores. If the relative humidity stays very high over several nights or more, the flattened trichomes will block the pores from taking in carbon dioxide from the air. In the daylight hours when photosynthesis normally takes place, the plant will not have sufficient carbon dioxide to manufacture sugar energy from the light.

People frequently wonder how we are able to grow tillandsias so well in our indoor apartments. Andrew Flower's insightful discussion also helps to elucidate why and how indoor-grown tillandsias use CAM metabolism so effectively.

1. Our apartments are relatively dry. I'm happy to get the relative humidity to 40-50% in the winter with the aid of humidifiers. Also (with air-conditioning in the summer) it never gets as hot as the conditions described in the article. Strange as it may seem we can grow all kinds of tillandsias very well with fewer of the problems faced by outdoor or greenhouse growers.

Most of my tillandsias are grown mounted on cork bark in an unobstructed east-south-east window; some are grown in a south window or under lights. Low altitude, mesic plants grow happily side by side with high altitude, grey, very xeric Tillandsias; they all adapt well to my indoor environment - a testament to the adaptability in Tillandsias that evolved in the genus over eons of evolutionary history as they moved from the ground up into the trees in response to cataclysmic changes in their physical environments, and

Tillandsia heubergeri

T. ionantha 'Zebrina'

Tillandsia xerographica
grown in a south window

to the power of natural selection.

2. We soak our Tillandsias for 1 to 2 hours which thoroughly fills their leaf capillaries with water. We generally do this in the morning or afternoon. But the water on the epidermis of our plants evaporates within a few hours and the trichomes are raised and do not block the leaf pores. Enough water will remain in their leaves for several weeks before they need to be soaked again, and if the indoor temperatures are not hot and the plants are not exposed to sunlight, they can go for 3 or more weeks without damage.

3. With a relatively dryer regimen, our Tillandsias are able to more efficiently use CAM metabolism to take in carbon dioxide at night.

4. Even if soaked at night, our Tillandsias will likely dry out fast enough to uncover the open stomata and permit the absorption of carbon dioxide. Still I prefer to soak my plants in the morning when I can more easily and closely inspect them.) ❑

TILLANDSIA XEROGRAPHICA AS DECOR FOR A TABLE SETTING

The architectural shapes of bromeliads have for many years attracted designers of interiors. When you see a plant in a room in films, on TV and in magazines it will often be a bromeliad.

Now, for the first time, I have seen a bromeliad used in a table setting design. The striking tea table design in the photo near the top of column 2 was taken from the October 10, 2012 New York Times. Note the strong weight of colors of the flowers, bowl and the teapot and cup on the right side of the table. The designer needed an object on the left side to balance the arrangement, one that would be color harmonious, strong enough to hold the balance, but would not distract attention from the teapot. The designer chose *Tillandsia xerographic* to meet these requirements; it is pearl-grey in color and has a beautiful shape and conformation that is attractive and fuses into the design. ❑

From the New York Times, October 10, 2012

NEWS and NOTES

2013 DUES are due and payable now. Single and joint memberships are $25.00; the domestic subscription rate for BROMELIANA is still $8.00 and an overseas subscription is $12.00. Please mail your check payable to N.Y. Bromeliad Society to Barbara Lagow, 54 West 74th Street, #603, N.Y.C. 10023.

BROMELIAD SYMPOSIUM - July 12, 2013 at the New York Botanical Garden/Fordham University as part of the Monocots V: 5th International Conference on the Comparative Biology of the Monocotyledons. Nine leading researchers will speak at the bromeliad symposium which was organized by Dr. Jason Grant of Switzerland. More details will follow.

OFFICERS
President.....Mimi Gussow
Vice-Pres..David McReynolds
Treasurer.....Barbara Lagow
Editor.....Herb Plever

DIRECTORS
Victoria Ehrlich
Cynthia Percarpio
Veronica Saddler

BROMELIANA is published 9 times a year by the New York Bromeliad Society, c/o Herb Plever, 172-34 133rd Avenue, # 8A, Jamaica,NY 11434. email address: hplever@verizon.net