BROMELIAD SOCIETY OF SAN FRANCISCO

MARCH 2019

Meeting Specifics

When: Thursday, March 21

Time: 07:30 PM

Recreation Room

Where: San Francisco County Fair Building

9th Avenue at Lincoln Way

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Bromeliads – A Personal Journey

This month **Dennis Cathcart,** owner of Tropiflora Nursery in Sarasota, Florida will be our speaker. His talk covers his love of nature, reptiles, and progresses through his introduction to bromeliads, to the formation of Tropiflora, and the stages of developing that business. There were many life events, trials, good times and bad times that led to where we are today. His hope is that our members will see something of our own lives reflected in his in pursuit of our common love of and interest in bromeliads. Always the dreamer and adventurer, he started Tropiflora in the early '70s as an outgrowth of a bromeliad collecting hobby. A "hobby gone bad" he says. Following years of collecting reptiles and traveling the Caribbean and Latin America, he discovered bromeliads, or they discovered him, and the direction of his life was changed for evermore. Dennis will be bringing plants for sale.

No one has signed up for refreshments this month, but we always seem to have plenty of wonderful contributors.

Pacific Orchid Expo 2019

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Here's a shot of the shared display area at POE 2019. The BSSF contribution is to the left of the Redwood, with the Lunar New Year lanterns. The Golden Gate Cymbidium Society is to the right of the central Redwood, and the Orchid Society of California is in the center. Thanks to Jana King for the design, and Wes Schilling for the beautiful Bromeliads. And Geof King, Ted Kipping, Stacey Michaels, Yolanda Huang, Cid Young and Julia Luy-Leibowitz. And special thanks to Tom Perlite for helping with the curtains, display lights accessories. Carl Carter for leading our group and keeping it operating smoothly.

A Group of Chaps

A group of chaps, all aged 40, discussed where they should meet for lunch. Finally it was agreed that they would meet at Wetherspoons in Uxbridge because the waitresses there were gorgeous. Ten years later, at age 50, the friends once again discussed where they should meet for lunch. Finally it was agreed that they would meet at Wetherspoons in Uxbridge be- cause the food and service was good and the beer was excellent. Ten years later, at age 60, the friends again discussed where they should meet for lunch. Finally it was agreed that they would meet at Wetherspoons in Uxbridge because they could dine in peace and quiet and it was good value for money. Ten years later, at age 70, the friends discussed where they should meet for lunch. Finally it was agreed that they would meet at Wetherspoons in Uxbridge because the restaurant was wheelchair accessible and had a toilet for the disabled. Ten years later, at age 80, the friends discussed where they should meet for lunch. Finally it was agreed that they would meet at Wetherspoons in Uxbridge because they had never been there before.

Hopefully, this article taken from the November/December 2014 Sunshine Coast Bromeliad Society Newsletter in Australia does not hit home with any of you

Dues are Due

A new year has begun and dues for our society are due: $15 for a single membership and $20 for a dual membership. Pay our treasurer, Harold Charns at the meeting or mail to Harold. See back page of newsletter for details.

The Carnivorous Bromeliads

Brocchinia hechtioides

Catopsis berteroniana

Brocchinia reducta

It was during Christopher Columbus's second voyage to the New World in 1493 that bromeliads were first collected and described by Europeans. During the five centuries since, at least 3,000 species have been described all of which occur exclusively in the Americas with the exception of only one species. When we examine this vast group of plants, we see a startling diversity in the differing shapes, sizes, structures and colours of bromeliads. This wide diversity and adaptability has enabled the Bromeliaceae to emerge as one of the most successful families of new world plants. Bromeliads have mastered terrestrial, epiphytic and even in some cases lithopytic habitats and within specific ecological niches, they can dominate local flora. Yet within this incredible group of plants, three particularly interesting species stand alone, for they have evolved the remarkable adaptations that enable the trapping of insects and other animal prey. They are the carnivorous bromeliads.

It may be surprising that just 0.1% of currently known bromeliad species are carnivorous. Carnivory in the plant kingdom is in all incidences, extremely rare, however tank bromeliads seem so naturally predisposed towards the trapping of prey that they would appear to be the most likely plants to evolve to become carnivorous - yet this is not so, they are far outnumbered by almost 600 species of non-bromeliad carnivorous plants. Three species of bromeliads belonging to two genera are currently seen to be carnivorous. Two belong to the genus Brocchinia (*B. hechtioides* and *B. reducta*) and one belongs to the genus Catopsis (*C. berteroniana*). In both cases, each genus consists of around 20 species, the overwhelming majority of which are non-carnivorous regular tank bromeliads. This in itself is unusual since all other genera of carnivorous plants consist exclusively of carnivorous species - perhaps this is an indication of a the recent evolution of carnivory among bromeliads. It is certainly clear that carnivory evolved separately in the two genera after Brocchinia and Catopsis diversified from an ancient common ancestor, thus carnivory has emerged at least twice in the Bromeliaceae although apparently, has been driven in parallel evolutionary directions.

All three species were first described during the late 19th and early 20th centuries as the botanical exploration of tropical parts of the New World intensified yet all three have remained obscure and little known until relatively recently. During the 1980s and 1990s, botanists discovered unusual morphological traits in C. berteroniana and B. reducta which displayed similarity to adaptations of known carnivorous plants. Experiments such as those conducted by Frank et al 1984 demonstrated that B. reducta, B. hechtioides and C. berteroniana caught prey much more readily than regular tank bromeliads and indeed in the case of C. berteroniana, 12 times more prey was caught in comparison to regular bromeliad species under identical conditions and circumstances.

It has always long been known that all tank bromeliads inherently trap insects which occasionally and

randomly fall into the plants' water reservoirs and drown but observations reveal that unlike regular tank bromeliads, *B. hechtioides*, *B. reducta* and *C. berteroniana* possess clear adaptations that actively elevate the rate by which insects are trapped. In essence these three bromeliads possess the ability to attract, retain, digest and absorb insect prey in fundamentally the same ways as other known carnivorous plants. *B. hechtioides* , *B. reducta* and *C. berteroniana* produce foliage that collectively forms upright, hollow, water containing leaf rosettes that store a permanent quantity of rainwater which functions as the plants' trap. The foliage in all three species is vividly coloured (bright yellow) and extremely conspicuous. The leaves of all three species are lined with a prominent coating of intensely UV-reflective white power. In the UV sensitive vision of insects, this powder coating must make the bromeliads stand out as brilliantly - perhaps to mimic conspicuous and often similarly shaped flowers. The presence of water and the occurrence of previously trapped dead insect within the leaves act as bait entice new prey. Sweet secretions akin to nectar occurring within the leaf rosettes of the carnivorous bromeliads have also been noted by botanists and may also act as an addition lures. The result is a brightly colourful and fragrant structure to which flying insects, beetles and ants in particular are drawn.

Perhaps mistaking the foliage for flowers, visiting insects explore the interior of the plants' rosettes perhaps in search of nectarines. The surface of the leaves of *B. hechtioides, B. reducta* and *C. berteroniana* is extremely waxy and very slippery. The UV-reflective white powder that coats the leaves is crumbly and loose and greatly hinders the ability of insects in securing a firm footing. The slightest movement of the plants in the wind or any falter on the part of the insect, causes it to flip and fall into the water filled leaf axils of the bromeliad. Trapped by the surface tension of the liquid contained within, the trapped prey is unable to climb up the slippery leaf exists, and eventually drowns. It is not clear the degree to which enzymes are secreted *by B. hechtioides, B. reducta* and *C. berteroniana* however the work of Plachno et al. 2005 demonstrated that at least simple enzymes such as Phosphatases are produced directly in the case of *B. reducta*. Bacteria and various micro organisms assist the digestion process and break down the soft remains of trapped prey releasing nutrients into the liquid contained within the bromeliads' reservoirs. The resultant nutrient soup is absorbed directly by the bromeliads leaves.

The same basic structure is consistent in the traps of all three tank bromeliads. The foliage is arranged in a compact watertight rosette that is capable of retaining water either centrally or in the plants leaf axils. The foliage of C. berteroniana forms a relatively broad rosette, which contains water predominantly in the plants' leaf axils whereas the foliage of B. reducta is arranged in a tightly tubular rosette which offers little or no space for axil reservoirs but a large, central resovoir in the middle of the leaves. B. hechtioides is midway between the two extremes. It produces a loosely arrange leaf rosette with large leaf axil resovoirs but also a large central reservoir. The differences in the trap structures perhaps reflect differences in the ecology and habitats of the plants. C. berteroniana grows epiphytically and therefore requires small, compact, relatively streamlined foliage that is less likely to overturn and spill while the much more tubular, upright foliage of B. hechtioides and B. reducta are always anchored to the ground as these plants grow terrestrially.

The foliage of B. reducta appears to be the most specialized towards carnivory and indeed this species generally catches the largest amounts of prey of all three carnivorous bromeliads. It is reasonable to suggest that insects may escape more readily from the leaf axil reservoirs of B. hechtioides and C. berteroniana than the deep, tubular, tight rosettes of B. reducta. Yet to achieve this efficiency, B. reducta has evidently compromised the efficiency by which it can photosynthesize. Its tightly arranged foliage forms an effective trap but since the leaves are positioned upright and overlap one another, far less sunlight is caught and the than the more widely spread foliage of B. hechtioides and C. berteroniana.

[This article by Stewart McPherson is reprinted from the 1977 newsletter of the Florida Council of Bromeliad Societies. Our next issue will complete this article.]

Quilling

What's that? Your bromeliad is growing up looking like a soda straw? It is probable the victim of what is commonly known as 'quilling'. Quilling is the cementing of the leaves caused by lack of good moisture while the plant is in an active growing period.

I have found through my years of growing that certain genera are more susceptible to quilling than others. These genera are *Vriesea* and *Guzmania.* Rarely do aechmeas quill, although I have seen *Aechmea racinae var. tubiformis* and *Aechmea* 'Foster's Favorite' quill. Within the genus *Vriesea,* certain hybrids and species are notoriously consistent in quilling. Among these are *V.* x *morreniana, V. ensiformis,* and unfortunately, *Vriesea* 'Viminalis Red' X *V. hieroglyphica,* which is a superb hybrid with nicely banded foliage and a fantastic, long- lasting, branched, blood-red inflorescence with, of course, yellow flowers. Within the genus *Guzmania,* the most likely to quill are G. *'Ferun',* G. *'Fantasia',* and occasionally G. *'Exodus'.* In addition, other species-of *Guzmania* and Vriesea will quill if grown very dry. (Foliage vrieseas are particularly susceptible.)

Besides dry conditions, some plants both species and hybrids are more susceptible because the leaves secrete a very sugary sticky substance, which, if not washed off regularly and thoroughly, causes the leaves to cement together. Cold night temperatures with very little humidity will help it to thicken and speed up the process and, in particular, young seedlings are extremely susceptible to quilling during this time.

Prevention

To prevent quilling one must maintain high humidity or quite regularly flush the plant with water to thoroughly wash it out. There is no better way to do this than in a long, hard summer rain. Otherwise take the plant to the shower with you, as an equivalent bathing procedure is very beneficial. Bathing a bromeliad? Maybe it sounds crazy but it works, not only to prevent quilling but to cure it.

If you have a plant that has already quilled, take a mild liquid detergent or soap and put several drops into the tight center and fill with water to overflowing. Let this mixture remain for half an hour then adds more water to overflowing. This procedure should produce lots of suds. The soapy water will dissolve the hardened glue substance, and then with the gentle use of a flat but blunt object such as a plant maker, the leaves may be loosened from the outer-most to the inner-most. Make sure after loosening the leaves that all traces of soap are flushed off the leaves with lots of water. This procedure leaves the plant clean and free to continue to grow by absorption of nutrients through not only the roots, but the leaves as well.

A recipe from Len Trotman - Note that although it will cause foaming to the center of the plant it can be left in without any harmful effects. It is also effective against mosquitoes, slugs, snails and other insects.

Mix 500ml Sunlight dishwashing liquid, 200ml household cloudy ammonia, and 100ml citronella or Pine-O-Cleen disinfectant in a container with five litres of cold water.

As this mixture is very concentrated, use only 2 to 4 tablespoons per litre of water in the stray solution and/or one litre in main 200 litre holding tanks with liquid insecticides, fertilizers or fungicides.

This article by Jerry Rack, former BSI president, is reprinted from the January 2017 newsletter of the Fraser Coast Bromeliad Society

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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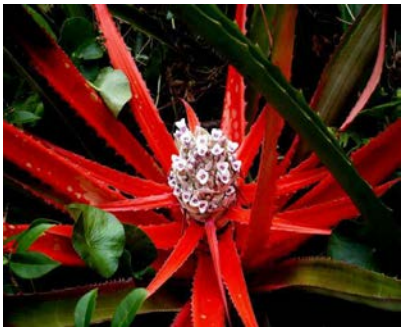

BROMELIAD SOCIETY INTERNATIONAL

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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