Far North Coast Bromeliad Study Group N.S.W.

Edition: April 2024

Agenda: General Discussion

Venue: PineGrove Bromeliad Nursery
114 Pine Street Wardell 2477

Phone (02) 6683 4188

Study Group meets the third Thursday of each month

Next meeting May 16th 2024 at 11 a.m.

Editorial Team:
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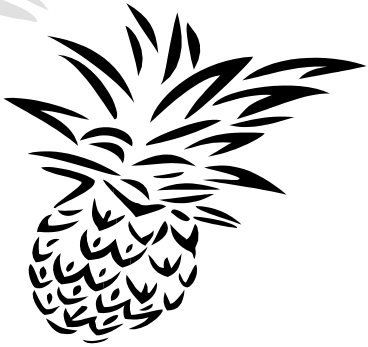
Life Members: Gary McAteer, Coral McAteer
Debbie Smith, Shirley Smith
Ross Little, Helen Clewett



Meeting 21st March 2024

The meeting was opened at approximately 11.00 am
The 8 members were welcomed.
Four apologies were received.

General Business

Newsletter feedback is always greatly appreciated, thank you for the kind words from a reader this past month. Our main effort or trouble we go to, is to answer in writing, questions raised by members at monthly meetings or during the month. Having the answer in writing in our Newsletter gives one hardcopy to refer back to rather than relying on memory.

On reviewing our March Newsletter Mitch mentioned about the difference in pollen characters in the Ochagavia article on page 12. While searching the web for information on another topic he came across a web site dedicated to pollen. As a hybridizer he found this site very interesting regarding the difference in pollen sizes, shapes, their ornamentation and structure.

PalDat - Palynological Database

In the tool bar click on **Search Data** and **Taxanomic Search**
Order - **Poales**
Family - **Bromeliaceae**

On the right of the page is - **Result - 344 taxon/taxa found.**

Click on each of the results to view pictures/scans of its pollen.

Thank you Mitch, some hybridizers may find this interesting in helping them understand why their attempts at crossing two different plants isn't working. Perhaps the plug and socket shapes don't match.

Are you running out of pots or have lots not being used or wanted?
The big green shed, Bunnings, at least those in our area have recycle bins for them. These are a two way bin, drop your unwanted, in good condition, not damaged pots in the recycle bin for other people to take for free and use them.

Traditionally many Tillandsia growers mounted their plants on cork, be it virgin cork bark, the first cut from the Cork Oak tree (*Quercus suber*) or wine bottle corks being the most recent choice for many growers due to accessibility.

Virgin cork slabs have been in short supply for quite some time now, however we have been informed that Portugal Cork Co. may be getting a new shipment of cork slabs into stock.

Cork - From Bark to Tillandsia Mount

Cork is the bark taken from the *Quercus suber* tree which is grown from an acorn in the forests of southern Portugal, Spain and other countries from around the Mediterranean. Being the only tree in the world that allows it's bark to be cut off whilst not doing the tree any harm. This process can be repeated every nine years which makes this a very special and valuable tree.

These trees can live for 200 years or more, however the first cut known as 'virgin cork' can only be taken after the tree is 25 years old. This is the cork slabs that we get and use for mounting our Tillandsias and other small bromeliads on. The next cut is often referred to as the 'second cut' or 'best cut'.

Cork trees absorb three or even five times more carbon dioxide than other trees. In Portugal alone which provides about 55% of the worlds cork production the cork tree offsets almost five million tons of carbon every year. Spain provides about 30% whilst other countries including Algeria, France, Italy, Morocco and Tunisia provide the remaining 15%.

Cork trees grow in other parts of the world but commercial production comes mainly from the Mediterranean region, where the cork tree grows naturally.

Cork Oaks of Burley Griffin

reprinted from: The Lanes, Canberra.

Centred in Canberra at the base of Black Mountain next to the busy Glenlock Interchange, is a cork oak plantation *Quercus suber.*

The plantation was initially established with acorns that Walter Burley Griffin, landscape architect and designer of Canberra, had imported from Spain in 1917. Walter Burley Griffin (1876 - 1937) had a vision for the new city of Canberra to be self sustainable and a cork plantation was included in his original plan for Canberra. The plantation was established by Thomas Weston (1866 - 1935).

The plantation is comprised of nearly 4500 ninety-year old trees established on 8 hectares (20 acres). It is the largest mature commercial plantation of cork oak in the Southern Hemisphere. Cork oak is a species native to southern Europe and has been harvested for centuries. The harvest, which involves the delicate stripping of cork tree's out of bark, can initially be carried out when the tree is about 25 years old and requires 3 'cycles' of harvesting (1 cycle every 10 years) before it produces cork of a high quality.

The plantation was left untouched until 1948 when harvesting or 'stripping' was commenced and the cork was found to be of both high quality and commercially valuable. In 1981 the plantation was harvested by ACT Forests by professional cork strippers from Portugal and again in 2001 when two Portuguese 'cork strippers' - Manuel Silva and Manuel Graça, helped harvest the plantation.

Open Popular Vote

1st	Michelle Hartwell	*Vriesea* 'Candyman Tasman'
2nd	Helen Clewett	*Neoregelia* 'Sonic Canvey Stripes'
3rd	Keryn Simpson	*Neoregelia* 'Manoa Beauty'

Tillandsioideae

1st	Gary McAteer	*Tillandsia araujei*
2nd	Keryn Simpson	*Wallisia cyanea*
3rd	Mitch Jones	*Tillandsia* 'Fuego'

Decorative

1st	Coral McAteer	'Broms and Eggs Galore'

Judges Choice

1st	Mitch Jones	*Orthophytum* 'Roberto Menescal'

Web Links for Checking Correct Identification and Spelling ?

Bromeliad Cultivar Register (BCR): http://registry.bsi.org/
Refer to this site for correct identification and spelling of your hybrid or cultivar.

Bromeliad Species Database (BSD): www.bsi.org/members/?bsd
Refer to this site for species identification, photos, descriptions and more.

New Bromeliad Taxon List : https://bromeliad.nl/taxonlist/
Refer to this site for latest species name changes and correct spelling.

Bromeliads in Australia (BinA) http://bromeliad.org.au/
Refer to this site for its Photo Index, Club Newsletters many with Table of Contents Index and there's Detective Derek Articles.

Keep these web sites set as desktop icons for quick reference access.

Where do I Find the Dates ?

www.bromeliad.org.au then click "Diary".
Check this site for regular updates of times, dates and addresses of meetings and shows in your area and around the country.

The Carbon Dioxide — 'The Gas of Life' article we published last month raised a few eyebrows, more so did the comment that was made during the Newsletter review, of the use of CO_2 in the commercial horticultural industry.

"Greenhouse growers do use CO_2 generators to boost plant yield, and rising CO_2 concentrations in the Earth's atmosphere – caused in large part by human influence - have indeed contributed to increased photosynthesis.
This is known as the carbon fertilization effect."

Greenhouse Carbon Dioxide (CO_2) Supplementation.
by Megha Poudel, Bruce Dunn, Sept. 2023 (reprinted here in part)

In general, CO_2 supplementation is the process of adding more CO_2 in the greenhouse, which increases photosynthesis in a plant. Although benefits of high CO_2 concentration have been recognized since the early 19th century, growth of the greenhouse industry and indoor gardening since the 1970s has dramatically increased the need for supplemental CO_2. The greenhouse industry has advanced with new technologies and automation. With the development of improved lighting systems, environmental controls and balanced nutrients, the amount of CO_2 is the only limiting factor for maximum growth of plants. Thus, keeping the other growing conditions ideal, supplemental CO_2 can provide improved plant growth. This is also called 'CO_2 enrichment' or 'CO_2 fertilization.'

Vale: Paul Isley III - March 18, 2024.

In 1976 Paul, Bill Harris and Jerry Robinson, formed Rainforest Flora Inc. in Venice, California, now located in Torrance, California.
Paul travelled throughout Central and South America, locating, studying, identifying, and collecting Tillandsias.

Rainforest Flora Inc. would become world renown for the Tillandsia hybrids it developed and distributed all over the world.

Paul published two books, 'Tillandsia' and 'Tillandsia II', earning him the nickname of "Mr. Tillandsia." (from BSQ April monthly Newsletter)

After our Central American tour in 2016 we visited Rainforest Flora and enjoyed a guided tour of the nursery by Jerry. Afterwards we met up with Paul at his home to collect a leather bound copy of his book, photographed here signing it for me.

Thank you Paul, a moment treasured.

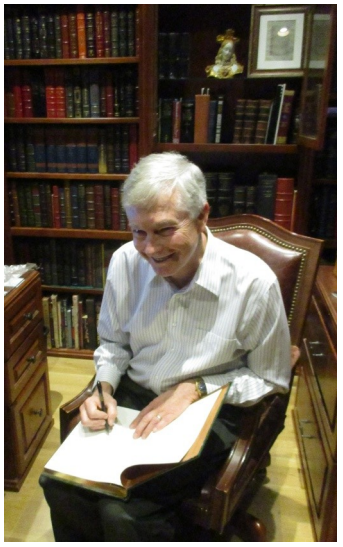
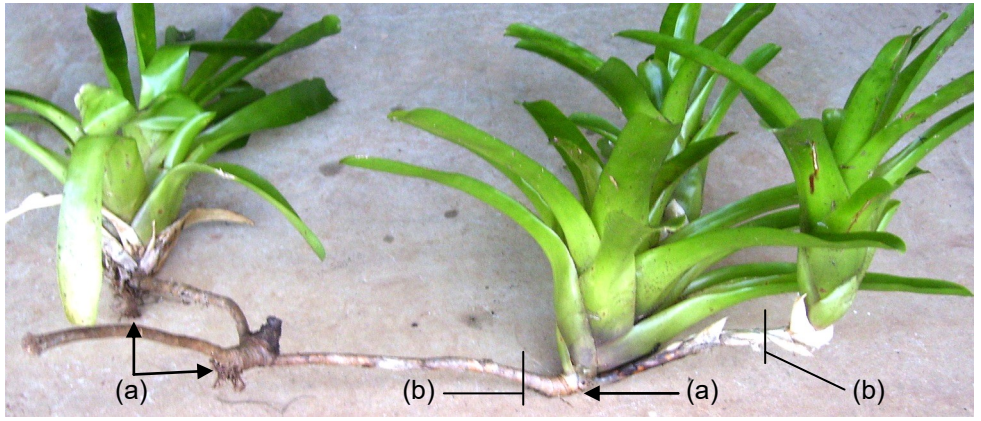


photo by Ross Little

Show, Tell and Ask!

Where along the stolon (a shoot, stem or runner that gives rise to a new plant) is it best to cut an offset from the mother plant ?
Basically anywhere along the stolon is OK, new roots will emerge from the heel



of the plant (a) not so much from along the stolon. A long stolon is difficult to fit into a pot, preferably cut no shorter than position (b) as marked.

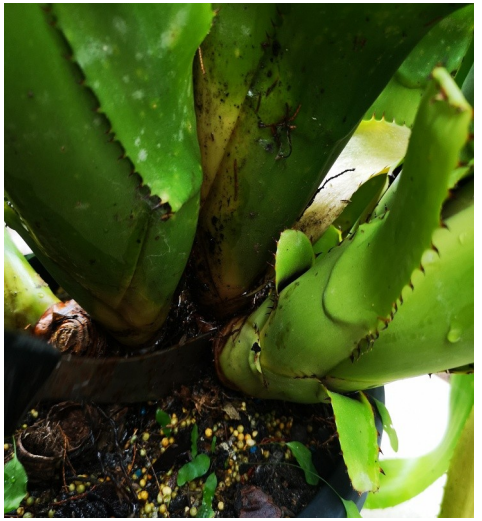
A long stolon can be helpful for stability if setting the offset into a crevice/hole in a rock wall. Long stolons are also helpful when attaching plants to trees, new roots will form from the plants heel and attach themselves to the tree (c) as marked.

Be mindful that on some plants new offsets can form along the stolon near to the parent plant, so check for a swollen lump like structure that may form a new plant before cutting too close.

Offset Removal of *Billbergia alfonsi-joannis* that flowered in October 2023 and featured in our FNCBSG NSW Newsletter November 2023. After flowering the clump was fertilized and has given four healthy pups now ready for removal.

Tools of trade: a wooden mallet and a sturdy knife.

When it is difficult to get a saw into the centre of a crowded clump, the mallet and sturdy knife come in handy. Position the knife at the connection point to the parent plant and tap it through with the mallet.



Knife positioned to cut the offset in a downward motion close to the parent plant.

Photos by Michelle Hartwell

Vriesea 'Candyman Tasman'
1st Open Michelle Hartwell

Neoregelia 'Manoa Beauty'
grown by Keryn Simpson

Tillandsia araujei
1st Tillandsioideae Gary McAteer

Neoregelia 'PineGrove Gem'
grown by Kayelene Guthrie

'Broms
and
Eggs Galore'
1st Decorative
Coral McAteer

Wallisia cyanea
grown by Helen Clewett

A multiheaded clump of
Wallisia cyanea
grown by
Keryn Simpson

Orthophytum 'Roberto Menescal'
1st Judges Choice
Mitch Jones

Photos by Ross Little

Orthophytum **'Roberto Menescal'**

The *Orthophytum vagans* type specimen is of a green plant that was collected in the State of Espirito Santo, Brazil, by an unknown collector and given to R. G. Wilson when he saw it growing in a garden near Rio in 1955. The plant flowered in Miami, Florida in October 1959 and was described by M. B. Foster in the Bromeliad Society Bulletin in 1960. In the description for *Orthophytum vagans* only the non-variegated plant was recognized, variegation was not mentioned. There has been an *Orthophytum vagans variegata* in collections for many years, where did it originate and when? Derek Butcher often said "taxonomists are not interested in variegation leaving them to be named as cultivars".

In Derek's search for whether this variegated form had been named but not recorded he found that Constantino Gastaldi in his 'Dyckia' website (2017) had coined the name 'Roberto Menescal' for an *Orthophytum vagans variegata* that was growing in the collection of Roberto Menescal. This plant was found in the wild by an unknown collector about 2000, possibly a separate sport/mutation.

Therefore it only seemed fitting that this striking variegated *Orthophytum vagans* be registered in the BCR in 2017 as *Orthophytum* 'Roberto Menescal'.

Some *Tillandsia ionantha* shown by Mitch Jones.

Tillandsia 'Fuego' is a form of *Tillandsia ionantha* that is found in a region on the west (Pacific) coast of Guatemala.

Tropiflora Nursery said:
"*Tillandsia* 'Fuego' was originally found in a Guatemalan mangrove forest."

This next form of *Tillandsia ionantha* is also found in Guatemala. This plant is sold under three different names. As they are plants that are found in a particular region, rather than propagated from a single plant, there will be slight variations within these plants.

Exported from Guatemala to Australia as: *Tillandsia ionantha* var*. ionantha.*

In Asia the same plant is erroneously sold as: *Till. ionantha* var*. stricta.*

Tillandsia ionantha var. *stricta* is also known as *Tillandsia* 'Rosita', this variant is endemic to one location in Oaxaca, Mexico.

When imported from Asia into Australia it is sold as: *Tillandsia ionantha* 'Thai Stricta'.

Neoregelia 'Sonic Canvey Stripes'
grown by Helen Clewett

'Bunny and Broms'
Happy Easter
by Kayelene Guthrie

'Happy Easter'
by Keryn Simpson

Genetics, Species, Varieties, Hybrids and Evolution - Part 1/4

by Frederick H. Gerber - Reprinted from BSI Journal Vol.11, No.5, No.6 and Vol.12, No.1

I have read with interest the registrations of new species in the *Bromeliad Society Bulletin* over a period of years, with equal interest the registrations of inter-specific hybrids, and finally with consternation (for it had long been my impression that by definition a species was a biologic unit by virtue of some genetic barrier between it and all other species) the registrations of bigeneric hybrids. For those familiar with the hybridization in the Orchidaceae this inter-specific and intergeneric hybridization probably seems natural enough, but it is important to a large segment of thought that the barrier against interbreeding is axiomatic by the very definition of the term, species.

It is argued by some that in the Orchidaceae this interspecific and intergeneric breeding refutes the taxonomic status of those groups involved. Some scholars maintain (Dr. Oakes Ames, *The Genus Epidendrum:* Botanical Museum, Cambridge, Mass., 1936, pp. 5, 6.) that all that complex of orchid plants listed variously as Cattleyas, Laelias, Epidendrums, Sophronitis, and others, among which and between which gradations can be found in nature, and among which and between which cross pollination and fertile hybrids result, should all be included in one genus, Epidendrum.

Needless to say, such a revamping of the taxonomy, what with the myriad horticultural members and the now involved hybrid status, could never be managed, The correction of names on the specimens in collection and the synonymy which would result in, for example, *Sander's List of Orchid Hybrids* would cause greater rather than lesser confusion, and it is perhaps better to propagate what might be an "unnatural" taxonomic system than to reduce the records to a meaningless state.

The awareness that there were more and more interspecific and intergeneric hybrids in the Bromeliaceae prompted me to go back and review the botanical concepts of the terms involved so that I would have a better idea of what was going on. It is the intention here to share my notes and ideas from what I have learned in my readings and observations in the hope that with this more or less fundamental botany in mind, those who are seriously concerned with the Bromeliaceae may have a fuller understanding of the divergences in a plant family and what may occur in their hybridization work. Also, it has become increasingly obvious that the word "hybrid" does not, of necessity, mean something superior — hybrids are not infrequently quite inferior horticulturally to the parental species used in making the cross.

Of particular interest is the recent notation from "Down Under" by Bromeliad Society member William D. Morris (Page 74 Vol. X; Sept-Oct. 1960) "I hope to

raise second-generation hybrids. I think too many people fail to get the most out of their plants, as they are satisfied with their primary crosses." The accumulated evidence in genetics would certainly support this conviction.

There are some more or less unfamiliar terms used in this report, and an attempt has been made to interject explanatory notes with these terms when used, rather than to use footnotes or an appended glossary. For those readers who are already familiar with these terms, indulgence is begged. Also for those readers who are aware of the gross oversimplifications in material as adapted, the same indulgence will be needed.

The attempt here is to draw a word picture of the bromeliad plant as a composite unit of cells dependent upon those plants which preceded it, a complex organization in a larger plant society having thrust upon it the latitudes and limitations of its genealogical past, rather than being some unrelated entity which happens to be pretty to "grow" and "show". In truth the plant is a very complex piece of nature, the result of inheritance, influenced by environment with the selectivity to survive limited by the "plasticity" of its genetic make-up, tempered possibly by mutations. Ultimately, we select our plants for the "growing" and the "showing", but whether or not we are aware of it our plants are subject to the workings of the genes they carry as a part of this complexity. The tolerances are determined by the genes and the latitude of tolerance "harks back" to ancestral forms which are still functional in the particular genes derived from those many parental individuals.

Although all the cells that make up any particular plant do not appear alike, and in fact are not alike, each one was developed from the fertilized ovule: the fusion of the pollen nucleus and the egg nucleus which is the beginning of the new individual. Pollination is not synonymous with fertilization. On pollination the pollen grain will produce a pollen tube which contains two nuclei. The pollen tubes grow down the style from the receptive stigma, and when eventually they reach the ovary with ovules, a single pollen tube will enter an ovule. At this point the pollen nucleus migrates from the pollen tube into the egg cell, and the subsequent fusion of the pollen nucleus with the egg nucleus is fertilization.

The now fertilized egg cell grows by a cell division process called mitosis. The nucleus of any cell in resting condition is a rather granular body surrounded by the cytoplasm of the cell whose function is primarily nutritional. At the first stage of cell division the materials of the nucleus begin to change in character. The materials which at first appeared granular begin a gradual process of "condensing", and soon there are discernible threads of nuclear material that are knobby and irregular. These threads are the chromosomes. They are called chromosomes because of their affinity for certain color stains used in cytological

studies. These shortening threads soon become quite short and thick and they become oriented on a middle zone area of the nucleus termed the equatorial or metaphase plate. At this stage of division these chromosomes become further oriented into like (homologous) pairs. Each of these chromosomes divides into equal parts by a longitudinal splitting. Each chromosome has a particular area of sensitivity termed a spindle attachment; and as cell division progresses, one half of each chromosome is dragged to opposite ends of the nucleus by this spindle attachment area which precedes it as though pulled on the end of a string. Under certain conditions of staining there may appear thread-like lines which are termed spindle fibers. Eventually on opposite sides of this nucleus there is an aggregate of one half of each chromosome that was in the original nucleus; the division of the chromosomes has been equal quantitatively and qualitatively. The original nucleus now divides further with the formation of two discrete nuclei each containing these halves of the chromosome material. As this stage is completed, a new cell wall divides the surrounding cytoplasm and the nuclear materials return to the granular amorphous condition, and we have two complete cells each identical with the parent cell from which they were derived. In this way our fertilized egg cell becomes two cells, and, in time these two become four and on and on *ad infinitum.* As the new cells accumulate there occurs a differentiation into different types of cells, some to become the one cotyledon (for Bromels are monocotyledons), some to become the radicle or primary root, others to be the plumule or apical tissue which will produce the first true leaf.

When this seed is finally ripe, it is encased in a seed coat. Under satisfactory growing conditions this seed takes up water, expands, ruptures the seed coat, and extends its primary root and its one cotyledon which in the light develops chlorophyll. With the production of this first green organ and the first root which takes up water and mineral our new plant becomes self sufficient.

Eventually the germinating seed becomes a full bodied plant and under proper conditions of age and culture produces flowers of its own. Here we encounter the second type of cell division. Until now all cell division has been mitotic, that is the equal division of all chromosome materials.

In the production of the flower a different type of cell division takes place. This process is called meiosis. As the time of production of ovules and pollen cells approaches, the nuclear materials orient themselves just as they have before; the chromosomes again become oriented in pairs on the equatorial plate. At this point, the processes differ. Instead of the chromosomes dividing longitudinally prior to migration to either side of the cell nucleus, one each of each pair migrates and the new nuclei derived do not not have the same components as the original cell. Each is made up of only one chromosome of each pair instead of half of each chromosome.

In mitosis, the usual vegetative form of cell division, the genetic materials which are present in the cell nucleus are divided into equal and identical bodies; in meiosis the chromosomal materials are divided into halves which are not identical to the parental cell. The chromosome number of the normal vegetative cell is diploid, the chromosome number of the reproductive cell having half the chromosome number is termed haploid.

The knobby areas which were detectable on the condensing chromosomes are the chemical complexes called genes and it is these genes which determine all the inheritance in our individual. They determine long leaf or short leaf, wide leaf versus narrow leaf; they determine pigmentation or lack of pigmentation; they determine tolerance of full sun or intolerance to drought; they determine flowering season; in short, they determine all the seen and unseen characteristics of our plant and all the tolerances of physiological responses.

If, for example, our plant has the hypothetical chromosome number of 24, that is - twelve homologous pairs of chromosomes - then each cell produced mitotically from any other will also have 24 chromosomes in as much as each chromosome divides in half longitudinally. And each cell in the formation of ovules or pollen cells will have a chromosome number of twelve being composed of one each of each pair.

When chromosomes gather at the metaphase plate (the equatorial zone), each pair becomes oriented with like chromosomes aligned with similar genes adjacent to similar genes. Dissimilar genes repel one another.

Sometimes something may go a little wrong with the full progress of the meiotic division; and although the nucleic materials may migrate normally to the poles (terminus of the spindle fibers are called poles), the nucleus does not finish division, and the cell so produced, even though it is destined to be a reproductive cell, has twice the normal chromosomes because the nucleus instead of separating into two nuclei does not separate and both chromosome complements end up in the same nucleus.

Meiosis has a second phase which is a second division of the nuclei with reduced chromosome number. This second division is typically mitotic in nature and each of the chromosomes divides longitudinally so that each of the four nuclei derived from this second division are like the cells derived from the meiotic division and are haploid. In the rare aberrant case where the first division was interrupted and a diploid second stage resulted, the four cells derived in the second division are also diploid in chromosome number rather than the haploid number typical of gametes (reproductive cells).

To be continued ……..