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

Study Group meets the third Thursday of each month

Next meeting 16th August 2012 at 11 a.m.

Venue: PineGrove Bromeliad Nursery

114 Pine Street Wardell 2477

Phone (02) 6683 4188

Discussion: July 2012

General show & tell

Dyckias and other spinies -- dividing and re-potting

Editorial Team:

Don Beard

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Meeting 21st June 2012

The meeting began at 11:28am with 27 members being present.
Visitors Adelina Luiardon and Bill Morris were made welcome.
Apologies were given for nine absentees.

General Business

Dennis introduced a cap which he designed and which bears the initials FNCBSG(NSW). This of course would be a nice addition to members' wardrobes when visiting other clubs and societies, and even on meeting days, particularly in summer. Dennis has set up the template with an embroiderer who is located in Lismore central near the newsagent opposite Woolworths. It's probable that a number of colours are available. The sum of $12 will get you the cap and the embroidery. Dennis will take your order if you wish to make a purchase, or order your own at the shop with Ray, Matt or Amanda. Good idea Dennis.

Trish mentioned that a microwave oven had been purchased for member's use, particularly during winter, for heating foodstuffs, soups etc. Please use it with care.

Another successful raffle netting $120 for the group. Thank you all participants.

Member's Show and Tell

Laurie displayed two forms of *Aechmea weilbachii* in flower. One the erect form the other *Aechmea weilbachii* forma *pendula* with a beautiful pendulous bright blue and red inflorescence. The latter best displayed in a position with some height so the inflorescence can drape. Ross also showed an orange *Aechmea weilbachii* forma *leodiensis* also in flower, as well as *Ae. weilbachii* forma *viridisepala* with green sepals.

Gary spoke a little on recycled tyre rubber on which he mounts epiphytes, both Orchids and Tillandsias. It is porous, so the epiphyte roots easily take hold and it is better wearing than cork. It also minimizes bugs and insect problems. Any good glue such as 'Liquid Nails' etc. is suitable for the initial attachment. Gary is trying to re-source this material, so anyone with information in this regard could contact Gary direct or alternatively any of the editors.

Lesley sought an identification for a *Billbergia* clump which was just short of flowering. She had bought it from a lady in Dunoon who had apparently grown it from seed. It appeared to have some *Bill.* 'Hallelujah' in the parentage. In fact it was probably impossible to put a name to it, as well as there being the possibility of it being a new hybrid. Ross suggested further researching provenance and parentage and with some success perhaps a new *Bill.* 'Lesley' will arise. The plant receives about four to five hours of sun a day and is of reasonably good colour. Ross suggested that after flowering the pups should be grown out under a range of conditions of sunlight and fertilizer (speaking of fertilizer it is probably getting a little too much) even up to the point of 'cooking' it.

Trish brought in two plants for identification. The first an *Aechmea* 'Belizia' in flower, a beautiful plant which she grows on the top shelf of her shade house under 50% shade cloth, the second an *Aechmea* 'Vin Rose' which she had won in a previous raffle.

Shane Weston from Goonellabah who has attended our meetings on three or four occasions, introduced himself as well as a beautiful *Vriesea* 'Galaxy' which is a variegated and banded plant and which had produced a multitude of 'grass' pups. A few of the current batch exhibited variegations, but Shane will wait for them to grow a little before removing them. He has already sold some seven variegates on e-bay. This plant is a shade lover and Shane grows it under a bench.

An identification for Reg is either *Guzmania monostachia* or *Guzmania patula*. A flower is needed before a relatively certain identification can be given.

Ross mentioned that when ditching plants or throwing out old mothers, keep in mind these plants are great survivors. Have a designated area where the casta-ways are always dumped and you will find many additional pups rising out of the remains like the proverbial phoenix.

Helen discussed the articles on page 15 (FNCBSG NSW Newsletter June 2012) regarding *Orthophytum* 'What'. She also displayed some of her own examples in order to stoke the flames of interest. Bill pointed out that there are often difficul-ties associated with deciding whether or not the progeny of such crossings (*Cryptanthus* 'It' X *Orthophytum saxicola* var. *rubra*) are hybrids/bigenerics or not. Perhaps the pollen of one plant may not 'take', which is one reason for the rarity of bigenerics. Generally however, most bigenerics are recognizable for their in-between state. Often, where no hybrid occurs, the plant has self polli-nated or the foreign pollen or 'mentor' pollen has induced self pollination. Intro-duction of a foreign pollen doesn't guarantee hybridization. Don't make assump-tions, look at the offspring closely. Bill thought that the cross presented by Helen was real and in fact a hybrid.

Dawn's unnamed plant turned out to be *Billbergia zebrina*.

From Around the Shade House

Tip from Linda Owens
Algae: At times a green slime appears in the water storage centre of our brome-liads. This algae can be hosed out, if it is left upon the leaves and allowed to dry out it will appear like thin tissue paper. It will need to be wet to be removed and sometimes a soft cloth will be needed to remove it all. It does not harm the plant but when it is thick it can stop the colour development in that part of the plant.

A Quick Easy Decorative Way to Display your Bromeliads

Article and photo's by Linda Owens -- Goodna, Qld.

Almost every one has a log or fallen branch lying around their yard, or if you are a wood bower bird like myself and collect different shapes and sizes around the home all the time. Transform that boring bit of now lifeless wood into a living work of art with some of your bromeliads to thrive on. My first port of call when selecting a piece is to make sure there are nooks and crannies for the bromeliad to be placed into for a firm hold. I then gather my bromeliad pups, hot glue gun and staple gun for those hard to set bromeliads, some will sit nicely into the nooks or crannies with no extra help required, but if access is there I use the staple gun to attach the bromeliad pup to the log, try to make sure you are not damaging new growth on your pup. When there is no access for the staple gun I will use a hot glue gun and put a dollop of hot glue onto the log where I want the bromeliad attached and wait for a count of 20 to give the glue a chance to cool slightly then firmly push and hold your bromeliad into place while glue sets more firmly.

For making a fallen branch into a bromeliad tree you can use a few methods for attaching the broms, zippy ties (cable ties), wool, Selleys Liquid Nails, stockings, anything you have on hand really. But remember NO COPPER as it will harm our precious bromeliad and kill it. I have a tree branch wired onto a star picket to hold it upright, the branch is close to 6 metres tall with smaller side branches. Whilst on the ground secure your bromeliads into place making sure they are firmly held allowing no movement, this helps them set root to the branch, then once your bromeliads are in place stand the branch against and tie onto the star picket.

For a centre piece on a deck or verandah try a smaller branch set into a pot full of concrete or gravel to make stable. Sit back and enjoy watching your new work of living art grow and thrive.

Smaller braches or pieces of timber can be used for our Tillandsias and when done can be a beautiful table decoration fit to suit any occasion. Let your imagination out of its cupboard, go wild you will be surprised at just what you can create with your own two hands.

Genus *Nidularium* by Peter Waters

The genus *Nidularium* consists of 46 species of medium sized bromeliads which are endemic to the Atlantic Forest and stretch from the very south to Bahia in north-eastern Brazil. As a general rule they live in the under story of the forest, although some can be found in sandy coastal areas on the perimeter and others range up to 2000 metres at the edge of the cloud forest. Many are terrestrial and others growing epiphytically inhabit the lower limbs of the trees. In cultivation they grow very satisfactorily in shady places and like plenty of water, although many can also tolerate quite a lot of sun. The main horticultural asset is the brilliantly coloured primary bracts which most display at flowering, and the length of time these are in colour, often for months.

In 2000, Elton Leme, the authority on Brazilian bromeliads, produced a monograph on the genera related to *Nidularium*. This included *Nidularium*, *Wittrockia*, *Canistrum* and the new genera, *Canistropsis* and *Edmundoa*. Prior to this time the rules separating the genera were quite arbitrary and included such details as the presence or absence of appendages on the petals. *Nidularium* had no appendages and this presented anomalies eg. *Wittrockia amazonica* had appendages but looked much the same as *Nidularium innocentii*. Leme looked at all the species in a new light and sorted them out on more obvious appearance attributes. Many of the previous nidulariums now joined the new genus *Canistropsis*. The main difference now is that nidularium primary bracts hold water, up to 100 mils in some cases, while canistropsis primary bracts don't.

When he studied the nidulariums he went to all the habitats of the known species and collected examples and together with some new ones he formed the opinion that they could be grouped naturally in accordance with the colour of the petals. He divided them into three initial groups, the blue complex, red complex and white complex. Since 2000 there has only been one new nidularium added to the genus and this must surely be an indication of the thoroughness that Leme devoted to the task.

The blue complex consists of 27 species and is the largest group. For practical reasons it has been divided into four sub complexes. The first, subcomplex fulgens, has an inflorescence not elevated and largish leaf spines. It includes *Nidularium fulgens*, *Nid. bicolor* and *Nid. atalaiaense*. While everyone is familiar with *Nid. fulgens*, *Nid. bicolor* has red sepals and blue petals. *Nidularium atalaiaense* grows near the sea just north of Rio and because of habitat destruction at beach resorts is now found on outlying islands.

Subcomplex scheremetiewii includes the species of the same name, *Nidularium utriculosum* and *Nid. rosulatum*. This last name has appeared on a number of spotted plants, but the real one has plain green leaves. *Nidularium utriculosum* was found in Copacabana, Rio de Janeiro but is now extinct in that area although it still can be found some distance away. This group has an inflorescence not elevated and smallish spines.

Subcomplex antoineanum has an inflorescence clearly elevated. *Nidularium antoineanum* has been in New Zealand in name for years and is now called *Nid.* 'Litmus'. It is not the true *Nid. antoineanum*.

Subcomplex procerum has 10 species which have stiff leaves. It includes *Nidularium procerum*, *Nid. angustifolium*, *Nid*. *serratum* and *Nid. cariacicaense*. These are all quite spiny. *Nidularium procerum* is very common and in New Zealand can be found under the name *Nid. terminale* and *Nid. kermesianum*. It is the most widely distributed nidularium covering the full range of the genus.

The red complex has only 7 species and the first subcomplex purpureum covers five species with plain leaves. *Nidularium purpureum* is an attractive species with brownish-purple leaves and is not the plant known in New Zealand as *Nid. purpureum*. This has white petals and is probably *Nid. innocentii*. Another small species is *Nid*. *altimontanum* which always has wine-coloured leaves and grows at an altitude of 1000 metres.

Subcomplex rutilans has spotted leaves and *Nidularium rutilans* is common in cultivation. Leme has included *Nid*. *regelioides* as a synonym of *Nid. rutilans* as it is found in the same areas and there were no major differences between the two species. The other plant in this group is *Nid. espirito-santense*. The suffix –ense denotes that it is named after the area where it was found, in this case the state of Espirito Santo.

The white complex of 12 species is divided into three. Subcomplex innocentii has petals without appendages and petal lobes that are flat on top. *Nidularium innocentii* is the second most widely distributed nidularium and is common in New Zealand with its leaves that are green on top and wine underneath. But this is not always the case as there are clones with all green and all red coloured leaves. *Nidularium albiflorum* can be confused with *Nid. innocentii* but is a smaller more delicate plant.

Subcomplex longiflorum has petals without appendages and petal lobes that are almost pointed. This contains *Nidularium longiflorum* and *Nid. campos-portoi*. *Nidularium longiflorum* is easily recognizable with its uniutriculate inflorescence. This means there is just one vase, unlike most nidulariums which have several vases among the primary bracts each containing a fascicle of flowers. Leme included *Nidularium innocentii var wittmackianum* as a synonym of *Nid. longiflorum* but this plant was not the one we had in New Zealand so there has been some confusion here. *Nidularium campos-portoi* with its striking inflorescence has yellowish petals and is easily identified.

Subcomplex amazonicum has petals with appendages and would have been included in genus *Wittrockia*.

Nidularium amazonicum looks very much like *Nid. innocentii* but has greenish petals. This group also contains the newest species, *Nid. rolfianum*.

The following is a list of all the presently recognized species of *Nidularium*:

Blue petal complex:
Blue (a) *Nid. linehamii*, *ferrugineum*, *bicolor*, *fulgens*, *atalaiaense*,
Nid. *ferdinando-coburgii*.
Blue (b) *Nid. utriculosum*, *jonesianum*, *scheremetiewii*, *kautskyanum*,
Nid. mangaratibense, *rosulatum*, *fradense*.
Blue (c) *Nid. bocainense*, *marigoi*, *antoineanum*, *meeanum*.
Blue (d) *Nid. catarinense*, *azureum*, *angustifolium*, *procerum*, *alvimii,*
Nid. viridipetalum, *serratum*, *cariacicaense*, *angustibracteatum*,
Nid. amorimii.

Red petal complex:
Red (a) *Nid. corallinum*, *purpureum*, *itatiaiae*, *altimontanum*,
Nid. apiculatum.
Red (b) *Nid. rutilans*, *espirito-santense*.

White petal complex:
White (a) *Nid. rubens*, *albiflorum*, *organense*, *innocentii*,
Nid. campo-alegrense.
White (b) *Nid. picinguabense*, *longiflorum*, *campos-portoi*.
White (c) *Nid. amazonicum*, *kris-greeniae*, *rolfianum*, *minutum*.

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Nid. atalaiaense

Nid. procerum

Nid. cariacicaense

Nid. viridipetalum

Nid. rutilans

Nid. innocentii

Photo's supplied by: Derek Butcher, Lesley Baylis, Ross Little

Tillandsia stricta
1st Open -- Laurie Mountford

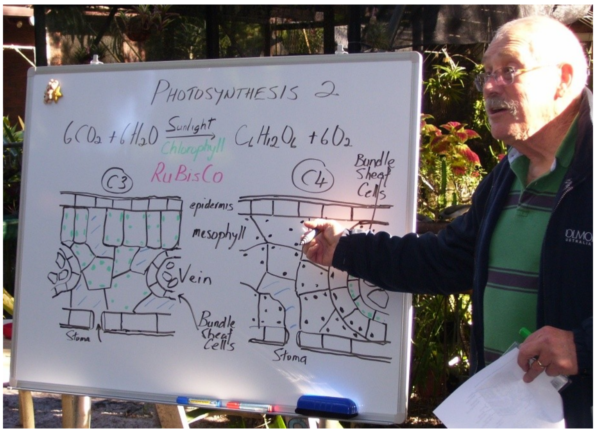
Vriesea fenestralis
1st Novice -- Wendy Buddle

Vr. ospinae var. gruberi x 'Tiger Tim'
Judges Choice -- Marie Essery

Billbergia hybrid
shown by Lesley Baylis

Aechmea hoppii
shown by David Lewis-Hughes

Dyckia tied down to keep firm into
potting medium (article p.15)



Don Beard discussing photosynthesis 2

Billbergia sanderiana
shown by Ross Little

Billbergia euphemiae var. purpurea x sibling
shown by Ross Little

Vriesea 'Galaxy'

Dried algae on neoregelia leaf. (article p.3)

Photo's supplied by: Ross Little and Derek Butcher

Photosynthesis 2 by Don Beard

This is the second talk by Don in a series of three. The initial talk (see Beard, D. 2012 Photosynthesis 1. FNCBSG NSW Newsletter, April: pp 6-7) introduced the Study Group to basic photosynthesis and the C3 pathway.

$$6CO_2 + 6H_2O \xrightarrow[\text{chlorophyll}]{\text{SUN}} C_6H_{12}O_6 + 6O_2$$

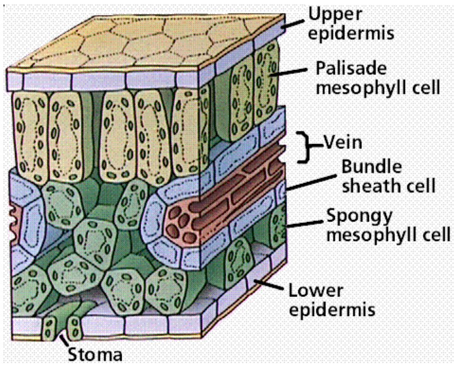
We will recall that the equation for photosynthesis, simply expressed, is as above. However one additional item needs to be introduced with respect to C3 plants, and that is the enzyme/catalyst RuBisCo. This is probably the most abundant protein on earth and is used to fix or trap carbon dioxide (CO_2) in the process of photosynthesis. In a C3 plant where the first product of photosynthesis is a molecule with three Carbon (C) atoms, RuBisCo acts alone.

Slightly up the evolutionary ladder are plants where the first product of the photosynthetic process is a molecule with four C atoms and where RuBisCo does not act alone. These are C4 plants and were developed along a number of parallel evolutionary lines in order to tolerate aridity, high temperatures and low CO_2. These C4 plants developed by some five to 10 million years ago, late in the Miocene. This was also during a maximum glacial period. These plants were all phylogenetically derived from C3 plants. Examples of C4 plants include grasses, maize, corn, sugarcane, sorghum and lots of weeds.

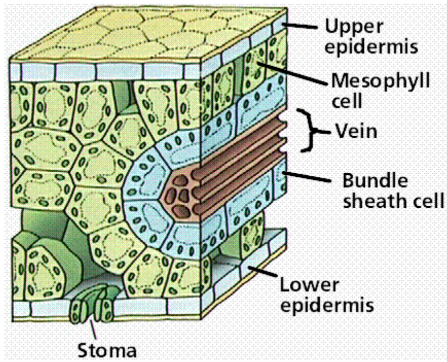
Leaf Anatomy

There are anatomical differences between the leaves of C3 plants and C4 plants. Note the differences between the two drawings on the following page. With regard to the vein or vascular bundle, the C4 leaf has a vein that is surrounded by thick walled parenchyma cells which are more tightly packed than for the C3 leaf. These are the bundle sheath cells (BSC) and in a C4 plant it is where the photosynthesis takes place (see photo p13). The much less tightly packed arrangement for the C3 leaf is what eventually allows CO_2 to escape back into the atmosphere i.e. the process of photorespiration. This process is negligible to absent in the C4 leaf.

C4 plants generally exhibit parallel venation and have more veins per unit area.



Cross section C3 leaf



Cross section C4 leaf

<u>The C4 Mechanism</u>

Whereas the RuBisCo in the C3 plant fixes the CO_2 (rather poorly) and prepares for the photosynthesis process in all the chloroplasts in all the mesophyll cells, the C4 plant has a more efficient way of fixing the CO_2.

It has a much more efficient enzyme called PEP which compared to RuBisCo has a much greater affinity with CO_2. When the stomata open in the morning, the PEP combines with the incoming CO_2 and forms oxaloacetic acid and then malic acid. Both these compounds have four carbon atoms in their makeup...hence the C4 pathway or C4 plant. The malate then travels to the bundle sheath cells (BSC) where it is converted back to CO_2 and PEP. The CO_2 is then fixed by the RuBisCo in the bundle sheath cells, and photosynthesis occurs with its resultant sugar via the C3 pathway and the Calvin cycle.

In bundle sheath cells

CO_2 + PEP

CO_2 + PEP ► oxaloacetic acid ► malic acid ► RuBisCo

Calvin cycle

Sugar

The combined efficiency of PEP in fixing CO_2, together with the tightly packed double ring of bundle sheath cells and mesophyll cells (called Kranz anatomy..... meaning 'wreath'), makes for an easy method of concentrating CO_2 without allowing it to escape. An efficient sugar making process. A marked contrast to the C3 plant. An additional feature of the C4 plant is its ability to close it's stomata in the heat of the day. This of course prevents loss of water. So with low transpiration, negligible photorespiration, and efficient sugar making we have evolved our drought, heat and low CO_2 tolerant plant. Note that photorespiration which is in general caused by the uptake of O_2 (oxygen) instead of CO_2 by the RuBisCo enzyme, undoes the good work of photosynthesis in the C3 plant. From the increased light use efficiency of the C4 plant we improve the quantum yield or in other words growth of the plant. As a consequence of this, many C4 plants are grown commercially and are recognized as some of the world's major crops.

C4 Plants: Occurrence and History

As stated before C4 plants include many grasses and sedges, many weeds including crabgrass and nutgrass. Also corn, sorghum, millet, sugarcane, and salt bush.

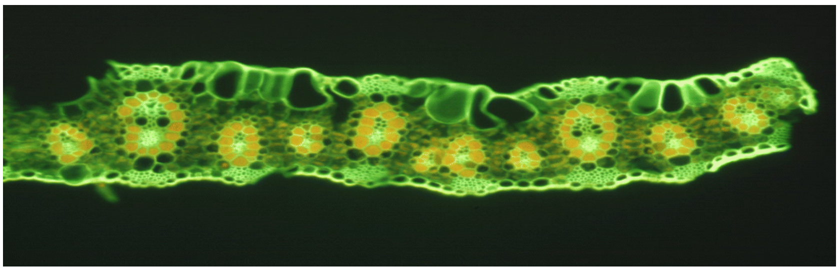
C4 plants make up 4% of the worlds plant biomass, 15% of all plant species, and 20% of plant commercial production. C4 plants are common as monocots (one seed leaf), 50%, and uncommon as dicots (two seed leaves), 0.6%. Some plants are intermediate between C3 and C4 pathways, i.e. C3 plants exhibiting C4 traits. Some young plants can switch from C3 to C4, some C3 plants have C4 characteristics in their roots, stems, and petioles. Obviously one is not drawing too long a bow to think only minor adjustment was needed for a C3 plant to evolve into a C4 plant.

Recent earth history describes a decreasing CO_2 level. During the Cretaceous (some 130 million years ago) CO_2 was at a level four to five times that of today. This level seriously decreased in the late Oligocene (25-30 million years ago) and continued decreasing to the end of the Miocene (5-10 million years ago) to about 400ppm (parts per million), a little more than today's level. Under these conditions C4 photosynthesis has developed a number of times in a number of plant lines in the 25-30 million years since the late Oligocene, getting to today's numbers by the end of the Miocene.

Assuming that low CO_2 is a pre-condition for the development of C4 plants, paramaters such as increasing aridity, high light habitats, increasing temperature and seasonality, fire, and the distribution of grazing animals, are all thought to play an important part in this evolutionary trend.

At temperatures 22^{o}C-30^{o}C, Quantum yields for C3 and C4 plants are the same
Temperatures above 30^{o}C, Quantum yields greater in C4 plants
Temperatures below 22^{o}C, Quantum yields greater in C3 plants.

C4 Plants	V	C3 Plants
* Can shut stomata in heat of day	*	Can't
* First product has 4 C atoms	*	First product has 3 C atoms
* PEP and RuBisCo	*	RuBisCo only
* Tight gas barrier about BSC	*	No barrier
* BSC have chloroplasts	*	BSC have no chloroplasts
* Venation... parallel and closer.	*	Venation… anything
* PEP loves CO_2 and wont take up O_2	*	RuBisCo can't tell difference between CO_2 and O_2
* CO2 absorbed and used fast	*	CO_2 absorbed and used slowly
* Photosynthesis restricted to BSC chloroplasts	*	Photosynthesis operates in all mesophyll chloroplasts
* No photorespiration	*	Up to 30% photorespiration
* Can utilize low CO_2	*	Needs high CO_2
* High rates of photosynthesis and growth particularly in tropics. Drought tolerant.	*	Lower rates of photosynthesis .Can't handle arid situations and high temperatures.
* Dominate open hot arid environments.	*	Low water usage efficiency.



Alloteropsis semialata – transverse section of C4 leaf showing veins and BSC. Cockatoo grass, occurs in northern Australia. (From Watson, L., and Dallwitz, M.J. 1992 onwards. The families of flowering plants: descriptions, illustrations, identification, and information retrieval. Version: 18th May 2012. http://delta-intkey.com)

On a final note, rice is a C3 plant. Science has for some years been striving to develop it into a C4 plant. Imagine what that might do for rice production and the world's food problems.

References: As with Photosynthesis 1, this presentation was gleaned from the following scientific articles and internet pages: Sage et al, 2011, The C4 plant lineages of planet Earth. J. Exp. Bot.; Sage 2004, The evolution of C4 photosynthesis. New Phytol. 161: 341-370;en.wikipedia.org/wiki/**C4**_carbon_fixation;http://www.marietta.edu/~spilatrs/biol103/photolab/c4photo.html;http://creation.com/c4-photosynthesisevolution-or-design;http://www.ehleringer.net/Jim/Publications/271.pdf ;http://plantsinaction.science.uq.edu.au/edition1/?q=content/2-1-5-c4-photosynthesis ;http://www.life.illinois.edu/govindjee/Part1/Part1_Hatch.pdf;http://oregonstate.edu/instruct/css/330/two/;http://en.wikipedia.org/wiki/Photosynthesis;http://www.emc.maricopa.edu/faculty/farabee/biobk/biobookps.html .

Helen's Heuristic Hunt # 3 -- Find a Word Answers

T	I	L	L	A	N	D	S	I	A								G
E	X	I	P	H	I	O	I	D	E	S							I
N	I																L
U	O						A	M	I	X	A	M					L
I	I															A	I
F	D	A	I	Z	O	I	D	E	S							N	E
O	E	D				A	L	O	C	I	D	N	A			I	S
L	S	U		R												T	I
I		R		E						E	I	R	U	A	L	N	I
A		A		T												E	
		T		O		L	O	L	I	A	C	E	A			G	
		I		R												R	
		I		T						S	T	R	I	C	T	A	
				A													
C	R	O	C	A	T	A					E	R	E	C	T	A	

aizoides	andicola	argentina	crocata	duratii
erecta	gilliesii	ixioides	loliacea	maxima
retorta	stricta	tenuifolia	tillandsia	xiphioides

Did anybody find our Group member's name that was hidden in the puzzle

Laurie

Dividing the Spinies   by Ross Little

Dyckia, Puya, Hectia, Encholirium etc. all fall into this category of the terrestrial bromeliads with nasty spines. They all produce pups, however due to their tough spiny leaves these pups can be hazardous to get at and remove, they aren't fun to play with often inflicting some nasty wounds so gloves for some are a must.

These plants use several methods for reproduction:
1) Seed -- sexual reproduction by the flowers, this method is quite unreliable especially with Dyckia's if one is wishing to reproduce species, as Dyckia's are one of the most promiscuous of all the bromeliads. Therefore if one is wanting to grow species from seed you would need to isolate the plant / plants of same species for controlled pollination. True to type seed can't be assured if plants are left in the garden for the birds, ants or bees to pollinate.

2) Pups -- asexual reproduction; a vegetative offset which can be removed. Firstly remove the plant from it's pot and scrape away excess surface potting mix to reveal the base of any pups. Gently move pups from side to side to manually break them off, often a push to one side with the thumb is enough. You may need to remove several lower leaves to get to some pups. However it is better practice to use a good sharp, sturdy bladed knife or cutters. Always try to get as much root with each pup as possible by cutting as close to or part of the mother plant if required, the mother will recover. Pot pups with roots and treat as normal. Pups with no roots may need to be tied down to keep firm onto the mix to enable root growth, elastic bands or twist ties will do just nicely.

3) Self Division -- the plant divides or crowns, often this can be into 2, 3 or 4 sections as conjoined plants. Dividing these is a little more difficult and requires care, a lot of practice helps. Firstly continue to remove the lower leaves until all the sections are clearly visible, these will look similar to a clove of garlic only they are all attached to a central stem and root base. It is the lower part of this stem we need to cut to enable separation. With a sharp knife cut just under the division lines and part way through the stem, repeat at each division point cutting the stem down to the roots. In doing this each new plant should get a share of the root ball, re-pot and treat as normal. If you didn't get any roots and your plant now looks like an onion, set this new plant into some fresh potting mix, use an elastic band or twist tie over the plant and pot to hold the plant firmly in position until roots have established. (photo p.8)

As with any offset /pup removal practice on plants you have plenty to spare, take failures as a lesson learnt and try not to repeat. Try removing pups at different times of the year, with a little observation this will assist in understanding which season works best for which genera. We may grow these nasty's in full all day sun, though from experience we found a little light shade offers a better survival rate when getting pups started, then gradually introduce them to full all day sun. Don't forget to take notes as you go.

Novice Popular Vote

1st	Wendy Buddle	*Vriesea fenestralis*
2nd	Kay Daniels	*Aechmea* 'Coral Beads'
3rd	--------	--------

Open Popular Vote

1st	Laurie Mountford	*Tillandsia stricta*
2nd	Shane Weston	*Vriesea* 'Dandy Man'
3rd	Marie Essery	*Vriesea ospinae var. gruberi* x 'Tiger Tim'

Judge's Choice

1st	Marie Essery	*Vriesea ospinae var. gruberi* x 'Tiger Tim'

Comments from the growers:

Wendy's *Vr. fenestralis* was particularly hard to fault. She says that the plant did it all itself, but that she did keep it protected from unusually hot and sunny days.
Kay's *Ae*."Coral Beads' was brought for sale and had been grown nicely.
Laurie's *Till. stricta* clump, a beautiful display, had also done it all itself. Although the plant received fair wind from the south, it was somewhat protected by trees. However it bears the brunt of most inclement weather. A delightful specimen.
The *Vr*. 'Dandy Man' of Shane's will shortly have that name registered. A lovely plant imported by Nigel Thompson as *Vr*. 'Tasman' hybrid X *Vr*. 'Snowman'. Shane believes the plant unique and will fetch good $$$ for the pups. So far two pups with no flowers.
Marie's *Vr. ospinae var. gruberi* X *Vr.* 'Tiger Tim', very nicely grown under 75% shade cloth. Only slightly off centre.

Bill Morris had been a guest judge for this competition and kindly shared some of his past judging experience with us. Bill had started off the original judge's school for the ABS.
A few salient points made by Bill follow:
Clumps and specimen pieces are very difficult to grow perfectly and a few minor problems don't matter too much to the judges.
Good plants are usually separated by relatively minor flaws. Experienced show participants are aware of this and make sure the minor flaws are eliminated and the plant is judged on its merit alone.
Judges' experiences are useful in determining difficulty of growth and for referring to past standards.