

Bromeliaceae



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The Bromeliad Society of Queensland Inc.

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Front Cover: *Billbergia* 'Ballerina' Photo by Ross Stenhouse
Rear Cover : *Billbergia* 'Strawberry' Photo by Ross Stenhouse

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From the Desk of the Editor

Earlier today I visited Bunnings at Rocklea, Brisbane to purchase some kitchen components to install in my son Bart's music studio and, as is my habit, I looked at the plants on display in the gardening section.

I looked for the bromeliads on sale, half expecting to see plants from the Society President's commercial nursery "The Olive Branch" however I couldn't see any. What I did see was magnificent *Alcantareas* and large *Vrieseas* from Greenstock Nurseries.

Does the name sound familiar? Does the name Bruce Dunstan (whom I call Mr *Alcantarea*) sound familiar? Well they are connected and I draw your attention to the Society's visit to the nursery planned for Saturday, 18th September. If the *Alcantarea Imperialis* var *rubra* and *Vriesea gigantea* on display and for sale at Bunnings are any indication then the trip will be worth the effort.

I think this particular store should be congratulated on the way they look after their bromeliad stock. All the plants looked in excellent condition and well cared for. How often do you have a look at the plants on sale at the large chain stores and the plants look pretty crook!

When I first joined the Society, one member told me the reason many people join is to get access to the plant sale tables at the monthly meetings. I didn't quite understand what he meant at the time. I was naive and thought that people simply swapped or gave away their plants. I certainly didn't understand that plants were a valuable item and a rare plant was particularly valuable.

I can assure you that I have had the scales lifted from my eyes and truly under-

stand how the system works. I have learnt that the Autumn and Spring shows are also absolutely great places to purchase plants as are the visits to nurseries that the Society organises.

Yes, that member was right, a good reason to attend the monthly meetings may be simply to purchase plants, the rest of the meeting is a bonus. This would be especially true for the beginners classes. I am in my fifth year as a member of the association and my fifth year as editor of *Bromeliaceae*. I still attend the beginners classes - every meeting I attend! I love them and still find that I learn something every time even though I often hear things repeated that I have published in *Bromeliaceae*.

You might think I would remember what I publish, but alas I cannot remember it all. What a shame because over my years as editor, I have published some very interesting articles by some of the world leading authors.

I guess that a number of you have noticed that there has been a bit of a delay in getting this edition of *Bromeliaceae* out, I can but apologise. It's been a combination of sickness, holidays and a large project on at work that have caused the delay. Simply when I have been getting home from work, I feel mentally drained - I guess I must be getting old.

Each edition I appeal to budding authors to try their hand and write a short article and illustrate it with a few images. The secretary said he is willing to type up for any member who wants to write an article but doesn't have the facility to email it or the skill to type it up.

It is part of my editorial policy only to accept both text and images in electronic form. I am not a good typist and I had a couple of bad experiences which made me make that policy.



The author, Rob Smythe certainly practices what he is preaching with these photos showing part of his collection.

Bromeliads on Trees

Author: Rob Smythe MSc

The first question which I always have to answer, but should not need to is:-

“Which bromeliads grow on trees?” The question should be, “Which bromeliads grow in the ground?” Nearly all the broms, which are popular with gardeners, grow on trees. In the wild, some grow on rocks, some both grow on lower branches and on the ground. Many grow all over the trees. The exceptions are; cryptanthus and pitcairnia. There are a lot of others but I don't think we see too many in collections. *Dyckea* springs to mind. The rock dwellers, like *alcantarea*s, should not find any trouble growing on trees. I have 6 plants on trees but I have yet to see how stable they are when large. Even cryptanthus can grow on trees if you place a pocket of dirt in a fork of a tree.

Next question is what trees can they grow on? There are ways and means to grow them on just about any species of tree. The best trees which I would suggest are ones with an open canopy like the natives- *grevillea*, *melaleuca* and especially the hard bark forms better known as *callistemon*. Exotics like (*frangipanni*) which lose their leaves in winter are ideal up here in Townsville as they produce heavy shade in Summer and are open to light in Winter.

My very favourite host tree is the tree fern *Cyathea cooperii*. I don't know why this is but experienced growers suggest live trees work much better than the dead slabs of this plant, especially for *tillandsias*. I use live trees mainly and do have a few tills on them which are growing OK. Principally I have *vrieseas* and *neoregelias* as the epiphytes. I use the dead logs as totems and I must say a lot of the till seedlings have thinned out on

these. I blamed the nesting birds so maybe the reason for poor performance is that they don't attach very well to open texture like tree fern (much easier for the birds to remove). Live tree fern roots would grow over the till roots and help hold them on. Tree fern trunks are just a conglomeration of roots. More details on trees and mountings can be found in a previous publication

“Weird and unusual places to grow bromeliads. Bromeliaceae, Jan/Feb 2009 pp 16 to 22”

Next question would relate to trees that lose their bark. Obviously we have a problem here so you have to place your plant on a slab of hardwood (see article mentioned above p21) which is then nailed to the tree. In a couple of instances, where plants have long runners, I have nailed the rhizomes directly to the trees or put a couple of nails into the tree and wired the plant to these. Only three of my gum trees have bromeliads on them.

One gum with permanent bark has self-sown *tillandsias* growing wild on it. Another with good bark has everything right up to the giant *Aechmea* 'Forest Fire' hybrids attached naturally. A third has plants attached to a frame and the frame is attached to the tree (in article referred to above pp 19). This tree is a lemon scented gum which loses its bark in great masses every year.

Some trees/plants that are ineffectual: Any plant that could be used as a hedge eg Lillypilly, *Xanthostemon*. They branch out from the base and continually need attention. I do have broms on these but it is a lot of work keeping them tidy and functional.

Trees with dense canopy like Mango and *Xanthostemon* are problematic. As mentioned above I use the latter, with a lot of work, but I had to let it grow large, and then take all the lower branches out so that the maximum amount of diffuse light could penetrate under the remaining branches. On

an overcast day there is no shadow and lighting under this pruned tree is just as good as outside the canopy. Tree ferns are the best example of this, naturally occurring, desirable feature of a high horizontally flat translucent canopy.

How do you attach the bromeliads?

There must be a myriad of ways. In the past I have used glue, stocking, black irrigation pipe, electrician's cable ties and conduit saddles. Basically, what ever you can find. Today I principally use three methods. For very light plants like tillandsias I use contact cement. I apply a little ring of glue around the base of the plant but above the rooting zone. Spread it out on the flattest part of the plant. Put a dab on the tree and spread it out likewise. Leave it for three to five minutes then press the till onto the tree. Plants with long rhizomes, I just use a clout (short nail with wide head) to fasten the rhizome to the tree, then a second one to stop any movement.

When I attach big plants, I nearly always use old carpet turned inside out and nailed so as to hold the base of the plant immobile. Note that nailing does not work very well with palm trees. These trees expand fairly fast and the nail holes open and the nails fall out. If the tree is fairly mature the problem is not so great. Angle the nails inward helps. Palms are quite good hosts in general as long as they are not growing too fast or are a variety with sooty black trunks. The mould tends to infect the plants and mortality can be high.

The BSQ Web Site

Don't forget that the society has a web site. We place urgent and general information and information on the site.

The URL is:

www.Bromeliadsqueensland.com

THIS IS THE TAKE HOME MESSAGE.

When do you attach the plants?

The very best time is when the plant has a pup and the pup's new roots are emerging. Old plants firstly turn off their root fertilizer absorbing functions and then their attachment function. Possibly all they do after that is take up water. Rarely will they grow new roots again. Those that do grow new roots, like vrieseas, often the new roots stay within the leaf axil feeding off detritus and don't emerge to attach to the tree. My rule of thumb is always wait. Attach them when the pup is starting to root.

Possums: - If you have wild possums (or tame ones like mine) they will run out of reach before stopping. So unless you are in drought they will not touch bromeliads that you can reach from the ground. Spraying dilute Epsom salts on any they desire will keep them away. Be sure to leave a trail for them to move up your trees. They are interested in the trees leaf tips, flowers and fruit not your plants. I must say one of the funniest bromeliad incidents I have seen involved a possum. I had a tree growing at about a 45 degree angle and I planted a bromeliad about every 20cm along the top of this leaning trunk. I scared a possum and he wanted to use as much of the top road as possible. He corkscrewed his way up the stem flat strap passing between every plant without trashing them.

White Ants: - this is something you may not have considered. Broms can be the source of water which white ants need, so they (the ants) don't have to come to ground to find water. The ants ate into a dead branch well up my gum tree appearing from a brom growing about 3 metres above the ground.

I do not grow only small pretty neoregeias and vrieseas on my trees. I have several large aechmeas and half grown alcantarneas growing mainly in forks in the trees. It is probably wise to keep these very low to the

ground as you would not want them falling on to anybody. So far none have fallen off. In fact, I have an *Aechmea blanchetiana* grown from US seed which I wanted to photograph as its leaves are narrower than the ones we see in our gardens. I tried to pull it down to photograph it but eventually gave up. It would not move. It did move later when a cyclone went past but it did not fall.



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Guzmania lingulata as *C. splendens* plate 3 1856



Guzmania lingulata pl 120 1707
courtesy Walter Till



Above: *Guzmania lingulata* near var *cardinalis* from Venezuela, photo by M Asmuss
Left: *Guzmania lingulata* var *caudinalis* painting

Guzmania lingulata

by Derek Butcher, originally drafted 2005
amended Nov 2009.

While we may be swamped by *Guzmania* hybrids these days, there are some who grow the species and this latest change is directed to you. Some may shudder at name changes but I find them interesting if I know the reason for the change.

These days it may be hard to realise that the first Bromeliads that Europeans were introduced to, came from the Caribbean Islands. *Guzmania lingulata* was but one that started in this fashion. In fact its first name was *Viscum caryophylloides maximum, capitulis in summitate conglomeratis!* See Lectotype from 1707. In those days botany was in its infancy and perhaps more was missed than recorded and what was recorded would have been insufficient according to modern-day standards. To track these misconceptions of the past is fascinating. In Monocots and Gymnosperms of Puerto Rico and Virgin Islands, in Contributions from the United States National Herbarium Volume 52: 1-415. 2005 on page 209 Proctor and Cedeno-Maldonado make interesting comments about the type species which does not have concolorous leaves!

I quote "Several varieties have been attributed to *Guzmania lingulata* (L.) Mez, mostly based on the size and color patterns of the leaves and the color of the bracts of the inflorescences (see L. B. Smith, Fl. Neotrop. Monogr. 14(2): 1349. 1977.). The variety with wide and concolorous leaves, which occurs in Puerto Rico, has been erroneously attributed to *G. lingulata* var. *lingulata*. This variety does not occur in Jamaica, where Sloane collected the type specimen for *G. lingulata*. On the other hand, only one of the varieties has been recognized to occur

in Jamaica. Instead of being considered the typical variety, the Jamaican taxon was erroneously attributed to *G. lingulata* var. *splendens* (Planch.) Mez. Thus, to correct the situation, var. *splendens*, with purplish striped leaves, must be considered a synonym of var. *lingulata*. In addition, a new name is hereby provided for the taxon previously referred to as var. *lingulata*."

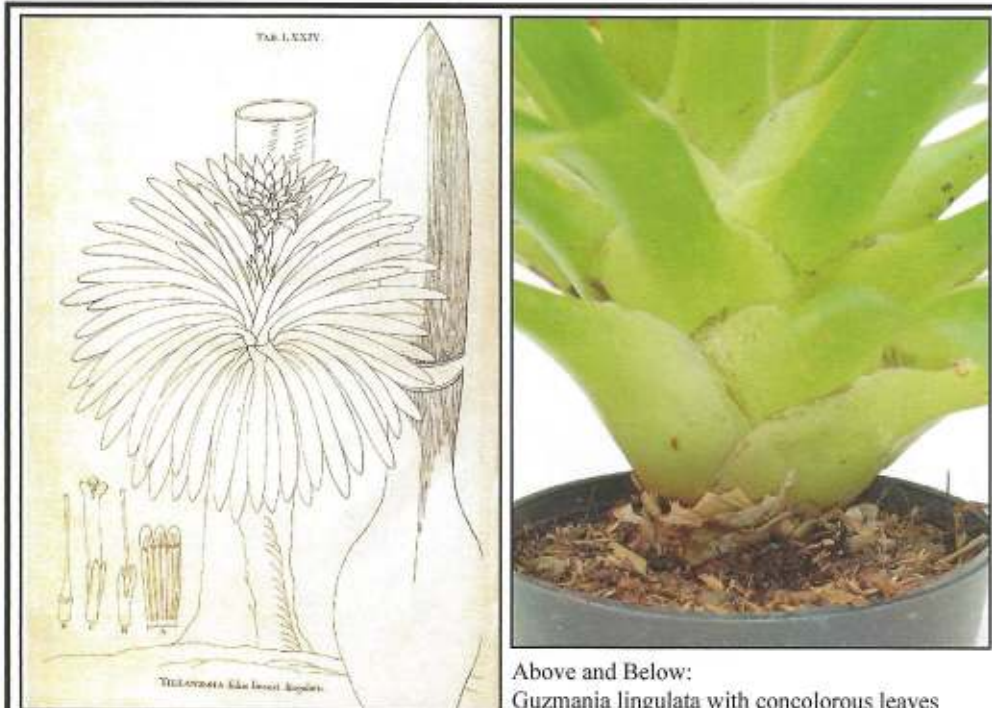
This means that the variety *splendens* with its leaves with red/purple longitudinal stripes mentioned by L B Smith, Fl. Neotrop. Monogr. 14(2): 1349. 1977 must be treated as synonymous with the type species *Guzmania lingulata* var. *lingulata*. What has happened to the plant with concolorous leaves? This becomes *G. lingulata* var. *concolor*.

Guzmania lingulata var. *concolor*
Proctor & Cedeno-Mald., Mono Gymno
Puerto Rico Virgin Isl. US Nat Herb 52: 209.
2005 Type: Puerto Rico; Sierra de Luquillo,
Loma La Mina, J A. Shafer 3279 (holotype:
US).

Fig. 41. A-C

Folia numerosa in rosula densa, 25--50 cm larga, interiora breviora, integra. viridia concolora; vaginae plerumque distinctae, ovatae, punctulato-lepidotae; laminae lineari-attenuatae, ca. 4 cm latae, acutae vel acuminatae. Bractee florales virides vel rubrae, erectae, lanceolatae vel lineari-attenuatae, acuminato-acutae, cucullatae, sepalis multo longiores.

Butcher's comments - But if Proctor and Cedeno-Maldonado had referred to Caraguata splendens Planchon 1856 - see photo - they would have seen that this species was described as having concolorous leaves confirmed by the illustration and that it was Mez who decided it had red stripes to the leaves. Both Planchon and Dietrich did not mention the red lines in the leaves but Beer did. Confused, well I am! If Proctor and Cedeno-Maldonado had accepted this then



Guzmania lingulata from Plumier 1755

Above and Below:
Guzmania lingulata with concolorous leaves
 Photo by M Asmus



they could have amended the description of var. *lingulata* to red lines and var. *splendens* to concolorous!

The presence or absence of red lines seems to have been overstressed as a taxonomic diagnosis. Baker 1889 who was known more of a lumper than a splitter, does indicate that *Caraguata lingulata* can have both concolorous or red lined leaves and we should leave it at that without defining unnecessary varieties (A view expressed by Gouda 1987) meaning this variety should be treated as a synonym of var. *lingulata*.

I referred this to Dr Walter Till and got a different slant to the problem. I ask you to look carefully at the 1856 painting where I see leaves with ridges or longitudinal veins. The only time I see red veining is in what I interpret as peduncle bracts. This is what Walter had to say:

"If you look carefully at plate 3 in *Allg. Gartenzeitung* you can see red longitudinal lines.

Mez was the first to make a distinction at variety level between concolorous and red lined leaves and attributed names to both types. In this way he interpreted the illustration (= Linnean type!) made from the specimen in Sloane's *Hortus siccus* (in BM) and you may accept this as an amendment. This means, as a consequence, that a variety concolor is superfluous from a nomenclature point of view."

Don't get too confused here, because Walter refers to the painting in the German publication in 1856 which is identical to the painting used by the Frenchman, Planchon earlier in the same year!

Gouda in *Flora of the Guianas* 1987 did express the view that there were so many intermediates in nature that it was impossible to maintain the varieties *splendens* and *minor* but this was not generally accepted.

If we follow the LB Smith concept a cur-

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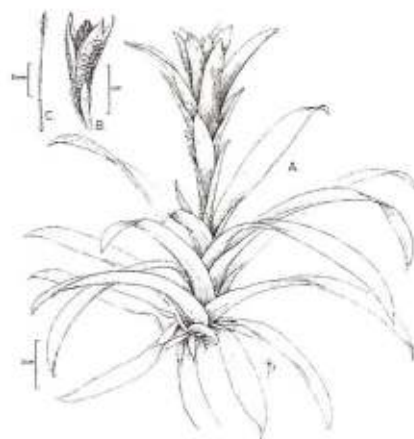


Fig. 49. A-C. *Guzmania lingulata* var. *concolor*. A: Flower; B: Ovary; C: Stigma and style with cell of basal ovary partially removed. From Shaw, S. et al. 1987. *Visual plants of central Panama*. (Shaw 55341-54, 741).

Above: *Guzmania lingulata* var. *concolor*
 Left: *Guzmania lingulata* 'Clarity'

Below: *Guzmania lingulata* 'Hoja Roja' - Photo by M Asmuss



rent key to the species is as follows

1. Leaf-blades more than 25 mm wide; plants large; floral bracts strongly cucullate; flowers numerous.
2. Outer (involucral) bracts of the inflorescence erect, red or pink. Leaves concolorous or marked with red-purple longitudinal stripes. var. *lingulata*
2. Outer (involucral) bracts of the inflorescence spreading, bright scarlet. var. *cardinalis*.
1. Leaf-blades usually not more than 25 mm wide; plants small; floral bracts weakly cucullate; flowers few.
3. Leaf-sheaths concolorous with the blades; outer (involucral) bracts of the inflorescence red. var. *minor*.
3. Leaf-sheaths castaneous; outer (involucral) bracts of the inflorescence bright scarlet. var. *flammea*.

As Eric Gouda points out (pers comm) if you used this key in the Guianas, you could easily end up with all varieties within one population area! This is despite the view that var. *flammea* and var. *cardinalis* are supposedly Andean, but such are the problems of evolution! The size of this species is very variable as you find, for example, in *Aechmea mertensii* and the number of flowers varies with the size of the plant, also striping is not always clear! The intensity of striping was also of concern to Matthias Asmuss. From herbarium material it will be very difficult to identify these varieties, because most of the differentiation is in the colour and direction of the bracts. For example, all the Guianan material have orange coloured bracts (not red) and little differentiation in colouration within the inflorescence. Also some identified as var. *minor* from Central America have red involucral bracts and white tipped floral-bracts. There are also very different looking *G. lingulata* forms (in size and coloration) from Central America including some that have been given cultivar names such as 'Fortuna' and a red leaved form 'Hoja Roja', although the latter has yet to be registered. 'Fortuna' has had this name, and been linked to *G. lingulata* since 1990 and I understand

it will be described as *Guzmania speciosa* by H Luther & K Norton in the near future. It has taken 19 years for this decision to be made. Such are the problems of identity and associated time delays.

As the retired Cultivar registrar I am reluctant to trespass too far into the area of the academic taxonomist, but I feel the so called varieties of this species should be looked at carefully. Things are not too rosy in the Cultivar side of things either because we have some 34 cultivars said to be different and said to have arisen from hybridising within this species with no involvement of pollen from other species. I won't list these here but when we had the Cultivar Register on line under the old system, the entering of *Lingulata* as a Cultivar Group in the Search machine for the Cultivar Register on <http://BSI.org> would have given the answer. Unreported intra-specific hybrids would, no doubt, increase this number because it is a very attractive species with long lasting inflorescence.

It was refreshing to me when I found that Matthias Asmuss, of Venezuela was actually growing species *Guzmania*. Thanks to his collection we were able to work through the new key to show you photographs of what we feel could be interpreted as examples of

the varieties.

Acknowledgements

I would like to thank Eric Gouda, Leo Dijkgraaf, Walter Till and Harry Luther for advice and access to ancient publications

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Metal Tape Dymo Maker

by Ross Stenhouse

I was reading the newsletter from Bromeliad Society of Greater Chicago looking for articles to publish when reading an article titled "Bromeliad Expose by Larry Giroux" I came across the extract below.

"We visited one of the Arizona cactus members' garden. We were impressed with Lee Brownson's labels. I have had trouble with many of mine getting lost or being moved around by animals. His labels were stainless steel attached to pieces of flagstone with pop rivets or screw and plastic anchor. This is a good way of keeping track of your plant names"

Now since I have been involved in growing bromeliads (about five years) I have found the problem is not knowing the plant name at the time of acquiring it, rather the problem is to have the label still readable a year later. The above seemed like a good idea, a metal label with the plant name in raised text.

The labels referred to in the extract above were made by the Dymo M1011 label maker. I found if you did a google search searching on the words "dymo stainless steel labels australia" a number of matches were returned .

One in particular caught my attention the Dymo M11 heavy duty embossing machine.

The accompanying text states "When the application is not suitable to use a self adhesive tape, simply hole punch the metal tapes using the built in hole puncher & wire or screw the tape onto any surface."

I think this tool could be useful, but it comes at a price. Check it out and let us know what you think!

Quesnelias

Researched by Patricia O/Dea

(Ed. This article was first published in the January/February 1996 edition of *Bromeliaceae*)

Quesnelias belong to the Bromelioideae sub-genus. They are native to the east-central part of Brazil where they grow in large colonies along the shoreline with the sea lapping at their feet. They also grow in the nearby swamps in wet sandy soils and flooded parts of the foothills. They are mostly terrestrial, but a few have been found growing as epiphytes in the mountains bordering the coastline. The genus *Quesnelia* is divided into two sub-genera - *Quesnelia* and *Billbergiosis*. Both of the species *Quesnelia arvensis* and *Quesnelia. quesneliana* pertain to the sub-genus *Quesnelia*

In 1844 the eminent French botanist Charles Gaudichard Beaupre was asked by his friend and avid plant collector, Mr Quesnel, who was at that time French Consul stationed at Cayenne in French Guinea, to describe a plant he had collected. As a result Gaudichard Beaupre named the plant *Quesnelia* in honour of his friend. *Quesnelias* are mostly stoloniferous, with stiff spikey spines. The inflorescences have only one spike with bracts of vivid rose-red colours and rose and blue petals, except for *Q. liboldiana* which has bright orange bracts and navy blue petals. This *Quesnelia*, looking very much like a *Billbergia* when not in bloom, is common in the states of Bahia and Rio de Janeiro where it is found in forests, mainly growing on rocks from near sea level to an altitude of 1500 metres.

Quesnelia. quesneliana (the original *Quesnelia*.) is found along the shore in the vicinity of Rio de Janeiro growing in the

sand almost at the ocean's edge. It forms impenetrable mats one to one and a half metres deep covering the seaside area. It is also found growing in trees in pasture land. *Quesnelia. quesneliana* has an open rosette of lettuce green leaves banded grey underneath and grey flower spike which may reach a height of one metre bearing a cone-shaped head of shingled crepe-paperlike rose bracts with white lepidote (small scurfy scales - trichomes) and looks like a torch. The flowers are white with lavender blue edges

Quesnelia humilis (low growing dwarf) is one of the smallest members of the genus. It is a tubular plant 20-25 cm high with plain blue-green leaves. Its clusters of flowers are a glowing cerise, the calyx is brilliant red, the petals are deepest blue. The plant has a semi-trailing or creeping habit of sending out long stolons, and can cover a considerable area.

Quesnelia marmorata (Marbled) is a highly decorative plant. It is found in the low coastal regions near sea level to an elevation of 800 metres. It differs from other bromeliads in that the stiff upright leaves, five cms wide, fan out from each side and does not spiral rosette. The foliage is light green-blue with a mottling of maroon spots. An unusual feature of this plant is the fruity fragrance given off from the centre a few weeks before flowering.

The flowers themselves are without perfume. The inflorescence tends to droop slightly, is branched and has a lovely variation of the plant, *Quesnelia. quesneliana rubra*. It is the same in all respects except that the leaves have a lovely maroon colour.

The inflorescence of *Quesnelias* is very spectacular however like that of the *Billbergia* and it is short lived. The seed is naked and contained in the berry which forms after flowering.

(Ed see image of *Quesnelia. quesneliana* bottom pg 19)

Wild Seed

Author: Rob Smythe MSc

Wild Seed in the Garden

It is always a joy to look at your trees and find a brom growing from wild seed. The first time I encountered this phenomenon was when I pulled down a lot of vine that was covering the tree. A host of young green neoregelias appeared from underneath. There were no plants growing further up the tree so this must be the result of a bird removing the fruit from the inside of the well of the plant digesting them or wiping its beak against the stem. My only concern was that the origin was unknown so they had to be assigned to the trash bin. Not such a joy after all.

Tillandsias appear everywhere in my garden even on the gum trees. Two friends have their garden abundant with wild tillandsia seedlings. The good news is they don't seem to spread very far. They can be very thick when young but up here in the tropics there is a host of birds that thin them out almost to extinction. I don't have a cat so I have plenty of birds. Tillandsia don't survive as nesting material. Probably, the fertilizer is a bit rich. All the same, they do drop bits and I have seen one bird shred the nest of the second bird when they were both building with old man's beard at the similar time and about 2 metres apart. One was a Leatherneck/Noisy Friar Bird (*Philemon corniculatus*) and the other Spangled Drongo (*Dicrurus bracteatus*). They built on the same two branches for several years.

Aechmea 'Forest Fire' hybrids show up regularly in my seed trays. My trays are in an old wire bird's cage so presumably these seed are dropped by feeding birds. The little black, soft berries are good tucker for city birds. The introduced Common Mynah seems

to like them most.

Edmundoa lindeni has appeared twice. Once, near the top of a *Cycas media* tree and the second was a great disappointment. We can't grow *Vriesea hieroglyphica* in the dry tropics. It can at times get to about half grown but never makes flowering size. We have tried all media even just stones. I have lost six plants and now have two more which I am trying in the coolest spot in empty pots. I'm in no hurry. I keep bringing seed up from Brisbane and watch it germinate and grow into little fellows. Darwin says "survival of the fittest". I was encouraging evolution to supply me with one suitable to our tropical environment. Twice I had success. The first one turned out to be *edmundoa* and the second time only a very ordinary looking plant that could be a hybrid crossed with a *neoregelia* survived. Again, as *edmundoa* has exposed soft fruit so I blame a bird.

The hybrid mentioned is a different story and was probably the result of a visitation by an ant to the flowers. Ants can also pick out seed and carry them back to their nest in very much the way depicted in the ant/picnic cartoons. This is why I use sealed seed growing containers these days. No hieroglyphics survived.

The old dead flower is another source of wild seed germination. It does not even have to be from the same plant. I have seen *alcantareas* germinating on the dead flowers of *neoregelias* below them. Those of you who use bark or coconut in your mix I think you all would have seen germinating seedlings somewhere in such a pot. Some *Tills* germinate all over their own inflorescences and form tangled masses on the saron of bush houses in the wet tropics.

What does all this mean? Not very much other than we throw away what might be little treasures but more likely rubbish! What about a bit of lateral thinking?



Examples of 'Wild-Seeded' tillandsias mostly about the author's garden.

Wild Seed in the Environment.

When I attended an Australian Bromeliad Conference in Cairns many moons ago (I'm in shock that was 11 years ago) there was discussion about bromeliads as weeds and more recently this has been taken up by Australian Government Departments (Bob Reilly, Quarantine Project Update Bromeliaceae Sept/ October. pp 6&7. 2009). You can only bring a plant into Australia after it has gone through the red tape.

It seems that if the plant already exists in Australia, it is weed checked and after about a year it goes on to the approved plants for importation list. If it is not already in Australia, approval could take years. It would be nice to go back to a broader system and get each genus approved. I would go as far as saying with Bromeliaceae the whole subfamily Bromelioideae (spines and berry fruit) could be approved. Bromeliads are all such slow growers that the whole family may never have weed potential.

I am now asking "What do you think? Is their slow growing nature enough to allow them in?"

Areas of Concern

Since Cairns I have asked myself what is a weed? I am sure there would be a 100 page definition somewhere which has never reached a consensus.

My thinking is:

- It must have nuisance value.
- Must germinate frequently, easily, and in most cases, quickly. In the garden it always seems quick but I remember some of the burrs in the bush which hung around (literally and metaphorically) for a long time. There will always be the exception.
- Must grow quickly. Same story as above, with the prickly pear being the obvious exception.
- Must not be disastrously attacked by any endemic disease or predator.

- Perhaps self pollinating would be a plus.
- Must spread easily. Wind and transmittable on animal fur are examples.
- Must outperform competing native species.
- Must find a niche that supports its needs without serious competition.
- It must do damage to welfare of other plants or animals.
- Must be wide spreading.

In Cairns, there was a lot of discussion about Old Man's Beard (*Tillandsia usneoides*). A relatively fast, exponential grower. Substitutes prolific germination with proliferation by breaking apart. There is an Everglades type of environment in the Innisfail area where it may be capable of establishing. The plant is spread widely by nesting birds up here in Townsville. My question is would it out-compete the pendulous lichens found in the swamps? There are few, if any thing that grows slower than lichens but I don't think that is a nuisance. In Cairns, a case was being investigated, but it was found that where it escaped it never became thick- for what ever reason. Things have changed dramatically since then.

A fungus has since arrived from the USA and we now can't even grow the plant without chemical assistance. For the moment we can cross this one off the list of possible weeds, I say "for the moment" as all brom gardeners are desperately trying to encourage the development of a fungal resistant form. Even if this does occur I can never see it becoming a broad based weed. *Tillandsia* genus might still need watching as they grow in funny places like on cacti and on power lines in countries where they are endemic. They would not find much competition here.

Neoregelia, *Billbergia*, *Aechmea* are probably the most populous genera in our gardens and are all slow growers with some taking 15+ years to flower. The fastest grower



Wild-seeded *Edmundoa lindenii*



Wild seeded Neoregelias



Wild-seeded alcantheriaeas germinating on dead neoregelia flowers



Prickled wild brom appearing in a tray of vriesea seedlings



Quesnelia. quesneliana

I have come across is *Aechmea pubescens* which has flowered for me in 10 months from seed but even that does not sound like weed potential. It might survive up here in open savannah country but only till the dry season set in. All the well type bromeliads would have a rough time becoming a weed on the driest continent on earth especially where wet and dry seasons are clearly demarked.

Dyckias - some reported to take 140 years to flower. Not really weed potential.

Some alcantareas have taken 40 years to flower but those pampered by horticulturalists have been known to flower in 2 years. Though they have wind dispersed seed and some can possibly self pollinate there are not too many tropical habitats where the low altitude ones might establish.

Strangely, there are some low altitude alcantareas which also attach to rock faces but don't spread significantly by seed. Bare rock faces up to 1300 metres high do not exist for the tropical high altitude ones. That is not saying they could not find a cooler low altitude spot down South. This is unlikely as they have not done this where they are endemic. Lack of available habitats in Australia wipes this genus off the weed list. I must admit that before I was interested in this genus I saw gardeners rake in thousands of seedlings coming up on bark chip around the base of the plant. This happened in the conservatory at the Townsville Botanical Gardens.

From where I live only one or two genera gives me any concern. In some of the gardens in Cairns I have seen Pitcairneas go mad. The native grasses have already been dominated by introduced Guinea Grass. If this hadn't happened would Pitcairneas have been a problem? They can look like a grass and they can even, in some cases, produce seed asexually but I feel they don't germinate wildly. Maybe, even needing a mycorrhiza to help them along. Purely speculation, as I

have limited tries to grow pitcairnea from seed. Fosterella went wild in the Townsville conservatory as well and was all removed.

To validate what I am considering possible would take a lot of research time, hence the long period needed to get import approval.

As I said at the start, my opinion is that none of the family Bromeliaceae is likely to become a weed, primarily because there are no really fast growing plants. This broad brush statement is probably attenuated by a couple of the more flimsy Tillandseas e.g. *Tillandsia usneoides* and *Tillandsia schiedeana*. All of the members of the subfamily Tillandsioideae have plumed seed so could be wind dispersed. This might be a worry.

The subfamily, Bromelioideae has fruit as berries. I don't think too many of the native birds would be interested in these in the wild. In the cities, it seems to be introduced birds that find them appealing. Humming birds are the most prolific pollinators of broms in their native environment. For all but the north eastern coastal strip of Australia, the Australian equivalent of the humming bird (*Nectarinia jugularis*) is absent. Even where it does exist there is a need for a second species of bird to carry the seed away. Together this adds up to Bromelioideae being a very unlikely weed. It would be simple for us if all this subfamily were declared non weeds from the outset.

Above is little more than just my opinion. Any of your observations and opinions I would like to hear.

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rsmythe5@bigpond.com.

(Editorial comment: The photos accompanying this article were taken by the author.)

Growing Conditions can radically affect the size and colour of big Neoregelias

Author and photographer: Sue Unsworth

My first experiments resulted in very small, but extremely colourful plants, as I grew them in consistently bright light all year around and with no fertiliser

I discovered that you can grow larger neoregelias if you grow them in shade, with small regular doses of fertiliser through the warm months. Here are some of the results from my experimentation.

The two plants below are *Neoregelia kauskyi*, both from the same parent plant and about 2 years old. The one on the left is planted in the garden, in good, rich soil, in filtered light. The one on the right has been grown with little, or no fertiliser and in all day bright light (under 70% beige shade cloth)



These are *Neoregelia* 'Predator' pups from the same parent plant and are about 12 months old. The one on the top is growing in a log with very little soil and fertiliser and in all day bright light (under 70% beige shade cloth). The lower one is the same age, but grown under the overhanging branch and is potted in a fertile soil.



Below are *Neoregelia* 'Jewellery Shop'. The one on the left is about 12 months old and has been grown in filtered morning sun, with fertile soil. The one on the right is almost 2 years old and has been grown with little, or no fertiliser and in all day bright light (under 70% beige shade cloth)



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Canistrum aurantiacum

Primarily from information supplied by
Derek Butcher

I was prompted to initiate this article
when I received the following email from
member Sharon Born.

Sharon's email also included a number
of images of the plant

*My friend Carol has this beautiful
bromeliad thriving in her garden. We would
like to know the name of it please. Even if it
is only the genus it belongs too, that would be
a great help. As you will see in the photo with
the dead flower the leaves lose their beautiful
apricot colour in the shade. I have included
all three photos as I am not sure which one
would be the best to use. It is a very large
and prickly plant.*

Not being an expert in plant identifi-
cation I forwarded Sharon's email to Derek
Butcher, who promptly came back with the
formal plant description which forms the
substantial part of this article.

Books For Sale

The Society has the following books for sale:

• Starting with Bromeliads	\$23
• Pitcher Plants of the Americas	\$60
• Bromeliads: A Cultural Manual	\$5
• Back Copies of Bromeliaceae (2005, 2006 Editions)	\$4
• Bromeliads for the Contemporary Garden by Andrew Steens	\$36
• Bromeliads: Next Generation by Shane Zaghini	\$33
• Bromeliads: The Connoisseurs Guide by Andrew Steens	\$36
• Tillandsia II by Paul T. Isley III	\$85
• Genus Tillandsia by Paul T. Isley III	\$12
• Growing Bromeliads third edition	\$25
• The Tillandsia tectorum Complex	\$25

Postage and package extra. Unfortunately we cannot supply overseas orders. Please
phone the Librarian, Mrs Evelyn Rees (07) 3355 0432 to order books.

Canistrum aurantiacum E. Morren, Belgique Hort. 23: 257, pl. 15.1873.

Detail from Leme in *Canistrum – Brom. Atl. Forest* 26-7. 1997

Synonym: *Cryptanthus clavatus* Brongniart ex E. Morren, Belgique Hort. 23: 258. 1873; nom. nud.

Aechmea aurantiaca (E. Morren) Baker, J. Bot. 17: 235.1879.

PLANT a terrestrial or epiphytic, propagating by short basal shoots.

LEAVES 15 to 20, suberect, forming a broad funnellform rosette at base;

SHEATHS broadly elliptic, 15-17 x 8-12 cm, densely brown-lepidote, dark purplish to brownish;

BLADES 45-130 x 4-5.5 cm, inconspicuously white-lepidote mainly abaxially, densely spinulose, spines dark brown, 1-3 mm long, green to yellowish-green with darker green spots, apex narrowly acute to subrounded and apiculate;

SCAPE 30-50 cm long, ca. 1 cm in diameter, erect to suberect, rigid, red, inconspicuously brown-lepidote;

SCAPE BRACTS narrowly ovate, apex acute and apiculate, densely imbricate, exposing to completely covering the scape, green toward base and brown-stramineous near the apex with age, densely brown-lepidote toward base, coriaceous, densely serrulate toward apex.

INFLORESCENCE tripinnate, centrally simple, flat at the apex, shorter than the leaf-blades, 5-6 cm long, 7-10 cm in diameter at apex (including the primary bracts), many-flowered;

PRIMARY BRACTS broadly ovate to suborbiculate, apex acute and apiculate, red, coriaceous, subdensely and minutely brown-lepidote, the outer ones suberect toward apex, 5.5-6 x 3.5-7 cm, equalling to slightly exceeding the fascicles, remotely spinulose to entire;

FASCICLES ca. 12, subpulvinate, the outer ones 45-55 x 2.5-3.5 cm, with 2 to 12 flowers, bearing 2 to 3 very short and inconspicuous branchlets;

FLORAL BRACTS narrowly ovate-lanceolate, apex acute and distinctly apiculate to acuminate, entire, red toward apex, inconspicuously and sparsely lepidote, 35-40 x 12-16 mm, distinctly nervate, slightly shorter than to slightly surpassing the sepals.

FLOWERS 40-50 mm long;

SEPALS strongly asymmetrical with a large semicircular lateral wing, 15-20 x 9 mm, subfree, glabrous, yellowish-orange, apex acute and mucronulate, mucro 1-1.5 mm long;

PETALS narrowly lanceolate, apex acute, ca. 25 x 4 mm, suberect toward apex at anthesis, yellowish-orange at anthesis and brownish-black when dry, bearing sublinear, obtuse, ca. 6 mm long appendages at the base, as well as 2 well developed callosities nearly equaling the filaments;

FILAMENTS the antepetalous ones adnate to the petals for ca. 15 mm; **ANTHERS** ellipsoid, ca. 4 mm long, base and apex obtuse; **STIGMA** subglobose, yellowish-orange, margins fimbriate;

OVARY narrowly clavate, slightly compressed, 15-18 mm long, ca. 5 mm in diameter; epigynous tube ca. 1.5 mm long; ovules distinctly apiculate.

FRUITS slightly enlarged, whitish toward base and purplish-blue toward apex, including the attached sepals.

TYPE: Brazil, fl. cult. Nov. 1872, Liege Hortus s. n. Holotype: LG, n. v. (photo HB). Clonotype: fl. cult. June 1874, Liege Hortus, s. n. (LG, n. v.; photo HB); fl. cult. Nov. 1874, Liege Hortus s. n. (LG, n. v.; photo HB).

DISCUSSION

Although the type of *Canistrum aurantiacum* and the respective clonotypes are well preserved at the University of Liege Botanical Garden, Belgium, none of the material deposited at this institution, including these type specimens, is available on international loan due to the size of the exsiccata, which are much larger than standard herbarium sheets. This ruled out direct examination of the specimens, but, thanks to the help of the American bromeliad specialist, Jason R. Grant, who visited this institution and provided me with photographs of the exsiccata, I could identify the holotype of the species by the inscription on the label. According to the protologue, it is the specimen that flowered in 1872.

Canistrum aurantiacum is not hard to identify. The species is very characteristic, well-represented in cultivation, and is depicted to perfection in the original sketch by E. Morren which is reproduced here (page 25). More robust specimens than that which is shown in the drawing flowered in 1872 (holotype), 1873 and 1874, and provide the basis for the original description of the species.

Canistrum aurantiacum is the largest species in the genus, and also has the stoutest, most compact inflorescence. This species is distinguished by its polyporate pollen versus the biporate pollen (where known) of the other species (Halbritter & Till, unpubl. data), which suggests that taxonomically, *C. aurantiacum* lies near the genus *Aechmea* and shows that Baker's (1879) decision to assign it to *Aechmea* was not completely erroneous.

Canistrum camacaense is the species closest to *C. aurantiacum* mainly by its leaf blades which are not narrowed towards the base, its much longer floral scape, larger flowers, and wider sepals with a much smaller apical mucro.

DISTRIBUTION & HABITAT

This species is endemic to Alagoas and Pernambuco states. The available specimens indicate that *Canistrum aurantiacum* survives in remnant patches of the practically extinct Atlantic Forest of north eastern Brazil, and also in the high altitude wet forests- enclaves lying in the heart of the semi arid North east. It is found from sea level to an altitude of 900m, forming dense populations on the shady forest floor (Siqueira Filho, 1997). It is also found growing on the lower half of tree trunks as an epiphyte. It is preserved in the Pedra Talhada State Park, in Alagoas, and the Saltinho Biological Reserve, Tamandare municipality, and the Dios Irmaos Ecological Reserve, in Recife, Pernambuco, where most collections have been made.

Canistrum aurantiacum apparently flowers from November to March, and sometimes on into May.

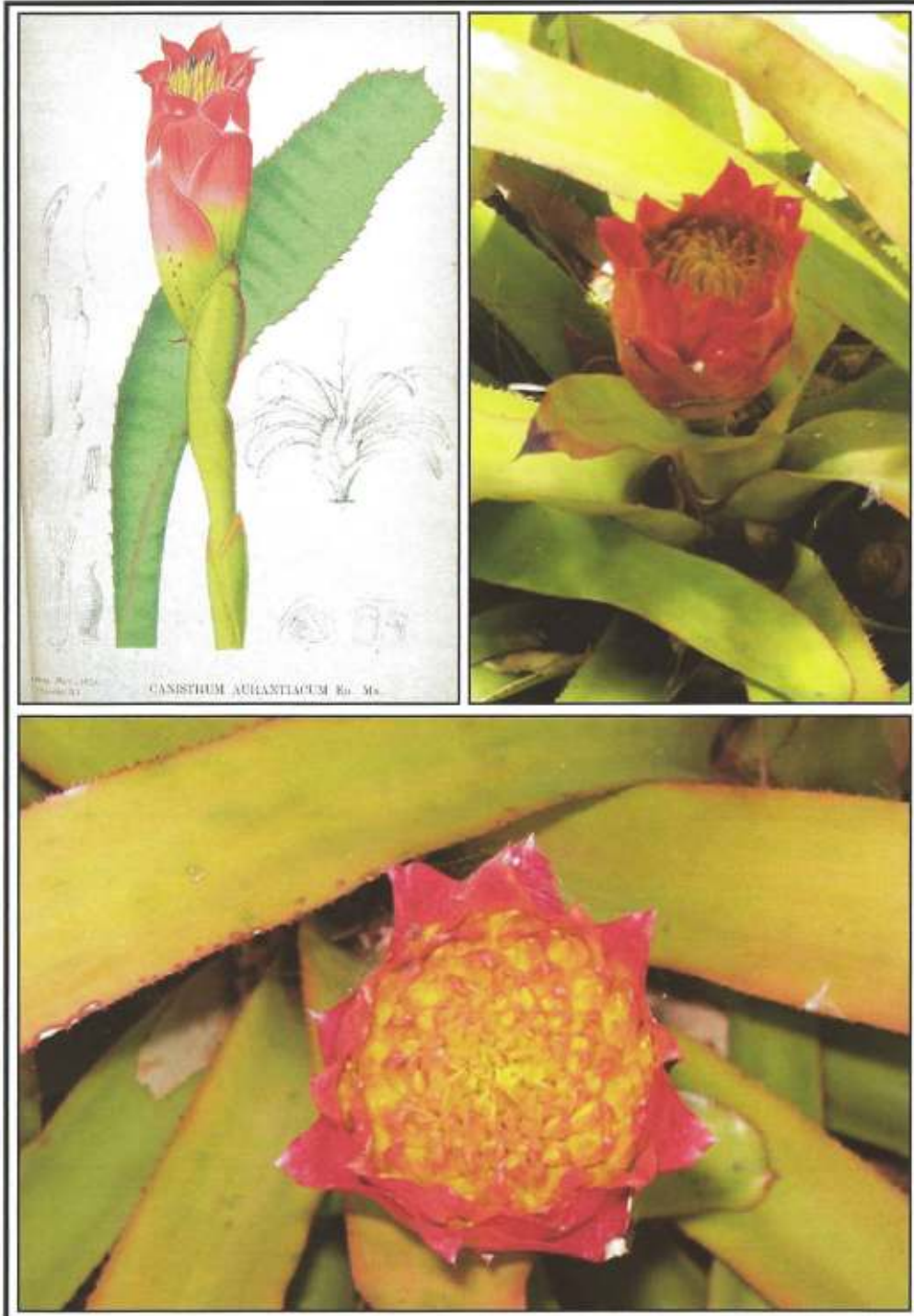
According to Siqueira Filho (1997), who has studied this species in detail in its native habitat, *Canistrum aurantiacum* is pollinated by small, pollen-gathering bees of the genus *Partanoma*, but its main pollinating agent is the hummingbird, *Phaetornis ruber*.

Flower Induction and Inhibition in Bromeliads

Author: Peter R Paroz

Ed - Reprinted article first published in Bromeliaceae in the September/October 1995 edition. There are a number of references in the article to recent studies, those should be read bearing in mind that the article was written in 1996. The article has been slightly edited. a table showing the results was left out as was the definitions of the abbreviations

One of the unusual attributes of bromeliads is that they can be induced to flower by



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chemical agents. The earliest references mention the practice of using smoke from fires to induce flowering in green-house grown pineapples in the Azores Islands. In 1932, Rodriguez showed that it was the ethylene component of the smoke which was the active agent. Since that time, there has been many investigations into other active materials. In recent years there have been numerous references in the *BSI Journal* to the use of A.N.A, Ethepon, and B.O.H for bromeliad flower induction. In commercial pineapple culture, A.H.A and Ethrel are used to induce flowering in the cultivars of *Ananas comosus*.

The usefulness of this procedure was limited because flowering could be induced, but there was no way to inhibit the natural flowering of the plant in a manner which allowed flower induction at a later time. In pineapples, A.N.A, which induces flowering at 10 ppm, effectively inhibits flowering at 100 ppm. and the duration of the inhibition is unpredictable and uncontrollable.

Research has shown that the internally produced ethylene is the active agent which triggers the flowering mechanism. Recent studies have identified the biochemical

pathways which produce this endogenous ethylene and have opened up the complete control of the flowering in bromeliads.

A recent paper by DeProft, and others, demonstrates the potential value of this new information. The test plants for this experiment were one-year old seedlings of *Guzmania lingulata* var *minor* which were treated by pouring 10 ml of the solution, at the concentration nominated into the centre of the plants, and observed, in part for the first time to flower open and the number of plants which flowered.

The results of the tests showed the complete inhibition of flowering by AVG and the induction or restoration of flowering by AVG. It also showed the substantial reduction in the spread of flowering in the treated plants.

The research results have far reaching implications for all who grow bromeliads: the hobbyist, the nurseryman or pineapple farmer because there is the potential to grow plants for flowering to a tight and predictable schedule.

Calendar of Events

Sat 18th Sept - Open Day to Greenstock Nurseries 9am-12pm 70 Wades Rd, Bellmere
A large range of Alcantarea species, giant Neoregelia, and tank Tillandsias. EFTPOS and credit card facilities available. Please bring a chair. For more info. contact Ruth (after 4pm) on 3208 0546 or Bev on 3208 7417

Sun 17th Oct - Field Day to Pam Butler's Garden 14 Sunset Grove, Samford Valley.
Bromeliad sales, Guest speaker. Ongoing morning tea. Please bring a chair. For more info. contact Ruth (after 4pm) on 3208 0546 or Bev on 3208 7417

Thurs 2nd Dec - BSQ Christmas Party at Arana Hills Leagues Club, Dawson Parade Kepperra, starting at 6.30 pm Cost \$25 per head Bookings and money to the treasurer ASAP

GENERAL MEETINGS of the Society are held on the 3rd Thursday of each month except for December, at the Uniting Hall, 52 Merthyr Rd., New Farm, Brisbane, commencing 7.30 pm. Classes for beginners commence at 7.00 pm.

ANNUAL GENERAL MEETING is held immediately before the February General Meeting

Plant of the Month Programme for 2010

FEBRUARY:	Ananus, Intergeneric Plants, Tillandsias and Full-sun Neoregelias.
MARCH:	Cryptanthus, Tillandsias, Full-sun Aechmeas and Canistrums
APRIL:	Cryptanthus, Tillandsias
MAY:	Spotted Neoregelias, Orthophytums, Tillandsias and Variegated Bromeliads
JUNE:	Alcantareas, Foliage Vrieseas, Dyckias, Hechtias
JULY:	Billbergias, Pitcairnia, Nidulariums
AUGUST:	Billbergias, Foliage Vrieseas, Catopsis and Miniature Neoregelias.
SEPTEMBER:	Billbergias and Guzmanias.
OCTOBER:	Vrieseas, Neoregelias, Nidulariums, Guzmanias
NOVEMBER:	Not often seen Bromeliads and Succulents

Competition Schedule for 2010

Novice, Intermediate and Advanced in each Class of the Mini-Shows and in the Popular Vote.

January: MINI-SHOW

Class 1: Aechmea - species and hybrids

Class 2: Vriesea - species and hybrids

Class 3: Dyckia - species and hybrids

Class 4: Any Other Mature (flowering) Bromeliad - species and hybrids.

February: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

March: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

April: MINI-SHOW

Class 1: Bromelioideae not listed elsewhere in the schedule – species and hybrids.

Class 2: Guzmania - species and hybrids

Class 3: Pitcairnia and Pepinia - species and hybrids

Class 4: Any Other Mature (flowering) Bromeliad - species and hybrids.

May: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

June: POPULAR VOTE: Any Genus – species or hybrid, Novelty Bromeliad Display

July: MINI-SHOW

Class 1: Billbergia - species and hybrids

Class 2: Tillandsioideae not listed elsewhere in the schedule – species and hybrids.

Class 3: Neoregelia - species and hybrids – up to 200mm diameter when mature.

Class 4: Any Other Mature (flowering) Bromeliad - species and hybrids.

August: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

September: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

October: MINI-SHOW

Class 1: Neoregelia - species and hybrids – over 200mm diameter when mature.

Class 2: Tillandsia - species and hybrids.

Class 3: Pitcairnioideae not listed elsewhere in the schedule – species and hybrids.

Class 4: Any Other Mature (flowering) Bromeliad - species and hybrids.

November: **POPULAR VOTE:** Any Genus – species or hybrid, Novelty Bromeliad Display

Note 1: Class 4 in each Mini Show schedule provides for any flowering bromeliad that would not be in its prime for the appropriate Mini Show.

Note 2: Class 1 (April), Class 2 (July) and Class 3 (October) provide for plants from these subfamilies not elsewhere included in the Mini Show schedule.



Billbergia 'Strawberry'

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