

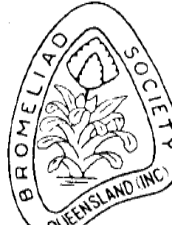
Bromeliaceae



VOLUME XLI - No. 5

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SEPT/OCT 2007



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Front Cover: *Tillandsia bulbosa*

Photo by Ross Stenhouse

Rear Cover : *Guz. 'Georgia'*

Photo by Ross Stenhouse

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Books For Sale

The Society has the following books for sale:

• Starting with Bromeliads	\$18
• 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

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

Book Review:
Bromeliads – The
Connoisseur’s Guide
(by Bob Reilly)

This book’s author is Andrew Steens. It is published in Australia by Florilegium and can be purchased from them (phone 02 9571 8222). It can also be purchased from the Society for \$36, plus postage – phone David or Evelyn Rees on (07) 3355 0432.

Andrew Steens is the author of the very popular *Bromeliads for the Contemporary Garden* (which can also be purchased from the Society). That book is primarily aimed at people just starting to grow bromeliads, while this book is more a collection of topics, and plants, of interest to the author.

The book opens with a chapter on bromeliads’ natural habitat and some of the people who collected them. Some advice on how to build a collection then follows. Several Queensland growers, namely, Bob Paulsen, Yves Daniel and Lindsay Gerchow, Cheryl Basic, Bromagic Nursery and The Olive Branch, are featured in this chapter.

A chapter on developing new bromeliads, e.g. through hybridisation, is next. There is some good advice in this chapter on how to pollinate bromeliads, as well as the formation and selection of “sports”.

The main part of the book is a selection of bromeliads that are of personal interest to the author. While many of these are described as rare, the majority are available in southern Queensland. While there are significant numbers of *aechmeas*, *alcantareas*, *guzmanias*, *nidulariums*, *tillandsias* and *vrieseas*, by far the largest section is devoted to hybrid *neoregelias*. There are, literally,

hundreds of colour photographs illustrating the various plants.

A chapter on growing bromeliads in various climates is next, while the book concludes with a comprehensive index.

If you have just started growing bromeliads, then the Society’s publication “Starting with Bromeliads”, may be more useful to you. However, the book is well worth buying for the many excellent photographs of a wide range of bromeliads, especially hybrid *neoregelias*.

Book Review:
Fragments of the Atlantic
Forest of North East
Brazil: Biodiversity,
Conservation and the
Bromeliads
(by Bob Reilly)

This book was published in 2007 by Andrea Jakobsson Estudio Editorial Ltda. Its editors (and major authors) are Jose Alves Siqueira Filho and Elton M.C. Leme. It can be purchased, in Australia, from Florilegium (phone 02 9571 8222) for \$170 plus postage.

The book has 415 pages and is profusely illustrated with colour photographs of over 90 bromeliads and their habitats. Many of the photographs are of flowering specimens.

The first four chapters cover various topics relevant to the current status of the Atlantic Forest of northern Brazil. This once extensive forest is now heavily fragmented,

and reduced to a very small portion of its former size. However, it is one of the most botanically diverse habitats in the world, and home to many bromeliads.

Of the 93 species described, 24 are published for the first time. There are:

Aechmea – 24 species, *Ananas* – 3, *Araeococcus* – 1, *Billbergia* – 2

Bromelia – 1, *Canistrum* – 4, *Cryptanthus* – 8, *Hohenbergia* – 5, *Lymania* – 1,

Neoregelia – 1, *Orthophytum* – 3, *Pseudananas* – 1, *Dyckia* – 2, *Encholirium* – 3,

Catopsis – 2, *Guzmania* – 2, *Racinaea* – 1, *Tillandsia* – 16, *Vriesea* – 13.

In each case, the plant is botanically described in considerable detail, followed by a discussion on botanically-related bromeliads, the plant's habitat, and some notes on its conservation status. Nearly all species are illustrated by a photograph of its habitat and a close-up of a flowering plant.

Some of the newly described species are highly ornamental such as *Aechmea atrovittata* (this plant is similar to *Ae.orlandiana* and *Ae.fosteriana*). Unfortunately many of these plants are critically endangered, being restricted to small areas of forest located outside conservation zones such as national parks.

While the book is well worthwhile reading, its price would cause most people to hesitate in purchasing it. I suggest you borrow the book, if you can, before you consider buying it.

Fungi in Bromeliads

Rob Smythe MSc

Usually fungal problems are not very evident in broms but they can occur and can devastate collections. I have read authors that recommend dumping all plants with collar

rot. Rather extreme. Usually I can find some good science to back up what I say.

On this occasion it is a bit limited as there is not a lot around and I have to interpret as best my science background will allow. This discourse should therefore be considered as little more than my opinion.

Prevention is better than cure. Some rules according to me, so:

1. Keep plants well spaced.
2. Keep good air movement.
3. Keep humidity below 80 %.
4. Keep plants stress free particularly regarding heat.
5. Wash rubbish out of vases.
6. Use well drained media.
7. Allow media to dry out occasionally.
8. Use fungicide as directed below..

Root Rot

By the time you find out that your plant has this it is usually too late to save the plant but you may be able to save plants growing on shelves underneath it. The disease is spread by water. The most likely fungi involved is *Phytophthora cinnamoni*

The treatment is as follows; with a sharp knife cut off the roots then cut progressively up the stem until you find all white flesh. If you are lucky you have half solved the problem.

The scientific explanation is that the fungus is filling and blocking the xylem tubes which transport fluids through the plant. Like having a blocked sink after you wash the hairy dog. Now your plant may still have partial blocking in the white tissue above your last cut so a systemic fungicide must still be used. Contact fungicides won't help at all. Clean up the area under the plant. I do one of the following.

1. Remove top soil and put it between two plastic sheets and place it in the sun.
2. Put infected materials into the mulch bin where offending fungi will compete

unfavourably with truly saprophytic fungi like mushrooms.

3. Clean up with bleach.

Foot Rot

This starts at the base of the plant rather than in the roots. Lower leaves rotting and drying out. The fungus responsible is *Fusarium oxysporum*

Collar Rot

This occurs part way down the plant. The give away sign is the beautifully coloured leaves in the wrong places. There are a couple of fungi recorded that fit the bill here: *Helminthosporium rostratum* or *Fusarium sacchari* var. *elongatum* cause dead spots in leaves.

These spots when near the water level go soft and when you pull the leaf off, the next inside leaf has a blemish in the same spot. I have found, using an infected plant given to me to experiment with, that if I keep doing this leaf removal I eventually come to a clean plant. The plant is infected in its leaf bases so the plant stem should still be OK.

My suggestion for treatment is, when you find an infected plant remove it from other plants and tip it on its side to dry out. Then when you have time remove spotted leaves, trying to avoid tissue damage to the stem and then thoroughly wash the infected area with a copious amount of water. Dip the plant into a preventative fungicide (non-systemic) and put systemic fungicide into the wells as the fungus may still be active inside the plant. Be patient - you should get pups.

Crown Rot

I have left this to now as really it can be any of the above but my experience tells me it is most often anaerobic bacterial rot as a result of rotting detritus accumulating within the cup. How do you tell the difference between fungal and bacterial infection? You treat the symptom not the cause so try and cut it away as described earlier. There is an 'Old

Wives Tale' to answer your question. Smell it-- if it has a rotten egg smell it is bacterial if not it is fungal.

I could imagine this to be true as the reason so many fungicides work is the fungi's love for fungotoxic sulphur compounds which just happens to be in rotten egg gas as well. Fungi may absorb this gas and hence no smell. A slimy feeling is also an indication of bacteria. There is a simple chemical test that you can do. Make up some weak Condies Crystal solution. It quickly turns brown in the presence of bacteria. This is something I found out by accident. I was testing water quality for a council. I found samples that discoloured this way correlated with bacterial analysis carried out by another worker.

Pock marked leaves.

Small pitting on the leaves. This is usually found on sheltered sections of the upper surfaces of crowded leaves. *Exserohilum* spp. is the cause and the treatment is to remove the plant to a well aired position. No other treatment is usually required.

Damping Off

Sterilize seed raising mixture. Again prevention is better than cure. *Pythium* spp. is often responsible and is another water carried disease.

General Information.

To Reduce Humidity

- Install Fans

- Install extractor

- Raise shade cloth to bench height. NB If you do this put weed mat in otherwise just one grasshopper might produce a family that could devastate your plants. The surface of your pots should have stones, scoria or whatever to stop hoppers from laying their eggs.

To minimise infestation

- Spray with a preventative fungicide after rain.

- Have dry out periods.

- Minimise points of entry like physical

damage to plants.

- Well drained media only.
- Keep wells clean.
- Remove suspect plants.
- Don't have orchids in the same bush house. Vandas and the like seem to nearly out grow similar root diseases and could be a source of spores. They grow new adventitious roots above the damaged area.

Research says:

- Don't use overhead sprinklers.
- Don't sprinkle late in the day.

In the dry tropics I ignore these latter two directives during our dry season. In fact I encourage watering in the evening for most of our popular genera to promote photosynthesis but this is another story.

Fungicides

I'm not going to recommend any specifically even though in my working career I did work with them as I did with fungi in my tissue culture work in latter years. All you need to know is.

1. Is it a systemic or non systemic? (you need one of each)
2. Is it toxic? (Usually not very)
3. Is it stable in solution? Do you have to make it and use it fresh?
4. Is it toxic to broms? (No copper in it)

From my flasking days I can give you further advice.

1. The more often you use a fungicide the stronger you will have to apply it to get the same result.

2. The ultimate success rate relies on the vitality of the plant. Sickly plants are goners before you start.

I have only listed the names of offending fungi in the hope that some fungicides may be known to work better against known species of fungi.

Tillandsias

Yes these are dying all up the coast from fungal infection. So far I have not re-

searched the cause. Someone might write and tell me. To the naked eye it looks like a type of yeast. It gives the plant somewhat of a sooty mould appearance. It is probably smothering the plant by blocking the pores.

It is quite deadly to the Old Mans Beard and I suspect is a problem to the less robust species. This would mean a systemic fungicide would not be the answer. A preventative fungicide might be the answer. If you are prepared to spray frequently any fungicide except the copper based fungicide will do.

You will have to take care that you don't overdo it as the fungicide deposit may become as suffocating as the fungal deposit. I am no tillandsia expert but I have seen the plant's grey colour return after spraying.

Good Fungi

There are a lot of plants that have a mutually beneficial relationship (symbiosis) with the fungi penetrating their roots. My experience by trying not to use fungicide on orchid roots was a disaster. Once I started spraying the roots plants stopped dying. Now I treat all fungi as bad.

I have circulated this article out to over 150 growers from Australia, New Zealand, USA, Thailand and South Africa. I asked for comments. The response has been that they feel it is correct. Nothing was disputed. This either means I am mostly right or there is a dearth of literature relating to broms and fungi.

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. It also is a resource for smaller societies to get articles for their newsletters.

The URL is:

www.bromsqueensland.com

The Editors Desk

by Ross Stenhouse

When I start to produce an edition of Bromeliaceae, I wonder where I will find all the articles to fill the pages. This is my 17th edition and so far- so good.

In this edition I received a number of short articles from members and that is good. I know that I must formulate each edition with a range of articles, some for the beginner, some for the advanced grower. Likewise I need a couple of feature articles and lots of shorter articles that are easy to read.

For example, Pat Coutts helped out that regard this edition firstly with a short article and accompanying images and then with an update and more images. This was great and I urge members to have a go and put together a short article and if possible include a couple of images. People really enjoy reading about what fellow members have been up to bromeliad-wise.

Rob Smythe's story on *Orthophytum gurkenii* growing in water combined with the article on page 9 "Thoughts on rooting difficult bromeliads" has prompted me to give this method a try. Of course, I have taken some images so if it is successful, I will write a short article about my attempt.

I would like to thank Bob Reilly for his article on "Vegetative Propagation". This is a collaborative work in a small way between

Bob and myself. I did the images to illustrate Bob's article.

We took the images at "The Olive Branch". Len and Olive have such a large number of plants, it is usually possible to find exactly what you need to illustrate a point.

It's easy to forget how difficult it can be for the beginner who has just started growing bromeliads. If you are fortunate enough to be able to attend the beginners classes at the monthly meetings then that is a great help.

The Society has over 540 members, the bulk of whom live in non-metropolitan areas of Australia. I think many of those members benefit greatly from articles such as Bob's. I am interested to hear from the country members about what they find difficult in pursuing their interest in bromeliads. Maybe there is something we can do to help.

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Thoughts on Rooting Difficult Bromeliads

Author: Dutch Vandervort

From the journal of the Bromeliad Society Jan-Feb 1991 Vol. 41[1] and reprinted in the Illawarra Bromeliad Society October 2007 edition of their Newsletter "Newslink"

For years I have had a terrible time getting offsets from some of my choicest plants to root. I have tried all kinds of mix, wetness, dryness, wet/dry cycle, rooting hormone, Superthrive, super phosphate, balanced fertilizers and every other variable I could think of. In spite of this, it regularly takes a year or more to get roots on the likes of *Othophytum naviooides*.

Just to prove it could be done, I once grew a hard-core terrestrial bromeliad, *Hechtia tillandsioides* in water. It grew well for about three years until my normally tolerant and accommodating wife got tired of having it on her kitchen counter and made me plant it in the garden.

The pup was about two inches (50 cm) tall, I stripped off about six or eight of the basal leaves, dipped it in a rooting hormone, let it dry and propped it up in a narrow-mouthed mustard (the label is gone, I can't remember the brand), which I filled up with clear water and a drop of Superthrive. That was it! The result was beyond belief. In less than a month my plant produced a fair mass of mature branching roots. Sibling pups potted at the same time have yet to produce their first visible root.

Does this mean that hydroponics is the wave of the future for bromeliads? Only time and experimentation will tell.

Bromeliads and Copper

Author: Ross Stenhouse

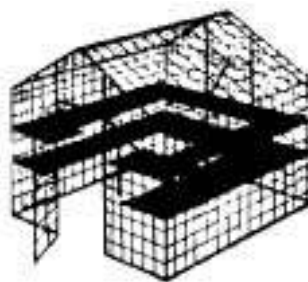
In this journal and in various talks given at society meetings, copper's toxicity has been highlighted. In particular, it has been stressed to members that having bromeliads anywhere near CCA (Chromium Copper Arsenic) treated timber is to be avoided.

The general experience has been that bromeliads are extremely sensitive to copper. There are stories around about adverse events involving CCA treated timber that is covered by several coats of paint. The question I would like to raise is about copper in fertilizers as a trace element. Does it cause problems with bromeliads?

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Vr. fenestralis - pup at the plant's base with leaf in front.



Vr. fenestralis - pup at the plant's base with leaf in front removed.



Til. secunda - clump with viriparous offsets



Til. secunda - shows attachment viriparous offsets to mother plant



Vegetative Propagation

(by Bob Reilly)

Editorial comment (Bob Reilly). This article is based on material which appears in pp 82-85 of Starting with Bromeliads.

Bromeliads have several vegetative propagation mechanisms. (A few bromeliads, mainly tillandsias, can only reproduce through seed. Most people will not encounter these plants.) The mechanisms are:

- Producing pups from the plant's base,
- Producing pups from the plant's upper stem,
- Producing adventitious pups from the plant's base,
- Through underground rhizomes to which new plants are attached.

Some people prefer not to remove pups. Instead, they allow the plants to form clumps, which can look very attractive. While this is your choice, generally speaking, more pups will be obtained if you remove them and pot them up separately.

By far the most common situation is where pups arise from "buds" at the base of the plants lower leaves. Once they are one third to one half of the parent plant's size, (taking into account both their height and width) then they can be removed (pups removed at an earlier stage only grow very slowly). If you delay too long in removing the pups of some bromeliads, then the pup's leaves can become malformed – see the photograph of a *Neoregelia* "Gee Whiz" plant and pup on p. 31.

Until you have gained some experience in removing pups, the following approach is recommended:

- Many bromeliads have small spines on their leaves. If your skin comes into con-

tact with them, then it will be scratched. So, you may wish to wear long leather gloves when you are handling these plants.

- Tip the plant out of its pot. (This makes it easier to see what you are doing and "work" on the plant.)

- Remove any leaves that obscure the point where the pup joins the plant. The photograph of *Vriesea fenestralis* on p. 10 shows a pup with, and without, the leaf which "surrounds" it. (Leaves can be removed easily by tearing the leaf in half, length-wise, and then tugging each half in a side-to-side motion. The leaf will normally come away easily from the plant. If it does not, try some more tugging).

- Check that the pup has a firm, rather than soft, base. If it is not firm, then leave it to grow on the plant for a while longer.

- Slide a knife blade (a serrated one that is 10 to 15 cm long is often a good choice) gently down between the plant and the pup. Gently tilt the pup away from the plant, so the blade can slide down all the way.

- Cut the pup off with a steady, sawing action. You may have to apply some force, when you are sawing, as the "connection point" can be quite thick and hard. (The photograph on p. 12 shows the point of severance for a *Neoregelia* 'Morado' pup). Gradually tilting the pup further away from the plant as you are sawing often helps.

- When sawing, check the "length" of the saw stroke so that you do not damage an adjacent pup or the parent plant.

- Periodically dip the knife blade in a concentrated bleach solution so as to minimise the chances of disease being spread. Wash the knife in water before using it again.

- Bromeliads will often produce several pups at a time, so repeat the steps outlined previously until you have harvested all the pups that are large enough to be removed.

- Remove any dead or dying leaves,



Neo. 'Morado' showing two pups in front of mother plant.



Neo. 'Morado' rubber band markers show where to sever pups.



Neo. 'Morado' showing severed pup



Neo. 'Morado' showing freshly-potted pup

and then place the parent plant back into its pot, “top up” the potting mix, and fertilise the plant with a continuous release fertiliser. Treat the plant as if it was still your “pride and joy” and it will normally produce at least one, and maybe several, more batches of pups.

- Pot the pup using your normal potting mix, but ensure it is firmly held in the mix. Otherwise, its growth is likely to be slow (at best).

- The pup can normally be planted to a depth of 1 (small pup) to 5 (large pup) cm in the mix without running the risk of rot occurring. (Pups can be potted deeper than these suggestions into very freely-draining mixes such as pine bark chunks). If the pup is unstable, hold it in position with bamboo stakes. The photograph on p. 12 shows a firmly potted *Neoregelia* ‘Morado’ pup.

- Pups can be removed during the warmer months, typically mid October to mid March, although some people avoid the hottest part of this period. (Pups removed during the cooler months will, typically, not grow while it is cool and may rot).

- If you happen to cut the pup too high, so that there is not a firm base, then it may not survive. However, it is worth trying to keep it, so allow the pup’s base to dry out in a shady spot for a day or two. Then treat it with a fungicide that does not contain copper, and a rooting compound, and pot it.

- Some pups are produced at the end of a hard, wiry “runner”. In these cases, cut the pup off with a pair of secateurs, leaving 0.5 cm of the runner still attached to the pup. The photograph on p. 14 shows the point at which a *Neoregelia tigrina* pup can be severed. A photograph on p. 14 shows a pup produced at the end of a long, wiry stolon on a *Pitcairnia* sp. plant. (The remainder of the runner can be cut off if you wish, as it will not produce any more pups. However, the parent plant may still produce more “runners”).

- As pups from many bromeliads look much the same, write out a label with the plant’s name on it, as soon as you remove a pup.

A few bromeliads (not many, thankfully) only produce pups on the upper parts of their stems. These require a special technique, and a lot of care, to remove them without destroying the parent plant. So, if you have one of these plants, known as “upper-puppers”, you may wish to ask for some help from an experienced grower.

The photographs on p. 16-17 show:

- A flowering plant of *Guzmania sanguinea* var. *tricolor* – this beautiful plant is an upper-pupper, and well worth trying to maximise the number of pups you obtain from it.

- An old “seed head” at the base of two pups. They grew from the upper portion of the plant and the seed head is now all that remains of it.

- A potted pup showing the parent plant’s seed head. When the pup was removed, a portion of the parent plant’s upper stem, including the seed head, was attached to it.

- A rather “bedraggled looking” plant from which several pups have been removed. Their severance necessitated the removal of the plant’s upper portion. However, another pup, shown as a small bud, has started to grow from what is left of the plant.

Some bromeliads, for example many *alcantareas* and certain *vrieseas*, produce grass-like pups (known as adventitious pups) at the base of their stem. This happens well before the plant matures. As these may be the only pups you will obtain from these plants (in other words, they may not produce any after the plant flowers), you need to harvest them.

Treat them as if they were miniature “conventional” pups. An approach that has



Neo. 'Grande' x pauciflora - pup on stolon showing point of attachment.



Neo. tigrina - showing long stolon.



Pitcairnia species showing plant on end of long stolon.



Neo. tigrina - green marker shows where to cut stolon.

produced good results for many people is:

- Wait until the pups are 10 to 15 cm tall. At this stage of their development, they should have a firm base. The photograph on p. 20 of an *Alcantarea burle-marxii* illustrates a small clump of such pups.

- Remove the plant's leaves as previously discussed.

- Using the tip of a knife's blade, gently "lever" the pup away from the plant stem. If you are successful (and it often requires a fair bit of practice to achieve success), then there will normally be a distinct "hook" at the pup's base. The photograph on p. 20 shows the distinct "hook" on the base of an *Alcantarea burle-marxii* adventitious pup.

- Pot them up as described previously.

Some bromeliads produce plants on underground runners or rhizomes. This is usually the case, for example, with *pepinias* and *pitcairnia*s. In these cases:

- Remove the plant from the pot.

- Break up the root ball, and untangle the mass of rhizomes.

- After making sure each rhizome has some roots and a plant attached, cut them off with a pair of secateurs.

- Pot them up so that the rhizome is buried under 1 to 2 cm of mix. Trim some of the leaves so as to reduce the chances of the plant wilting.

- Stake the plant, if necessary, to ensure it is held firmly in the pot.

These techniques should help you to build up your bromeliad collection. Over time, you may wish to refine them so as to produce the best results for your growing conditions and plants.

Want to contact the Editor?

Email Address is:
rossjanstenhouse@hotmail.com

Bromeliad Trichomes

Compiler: Peter Paroz

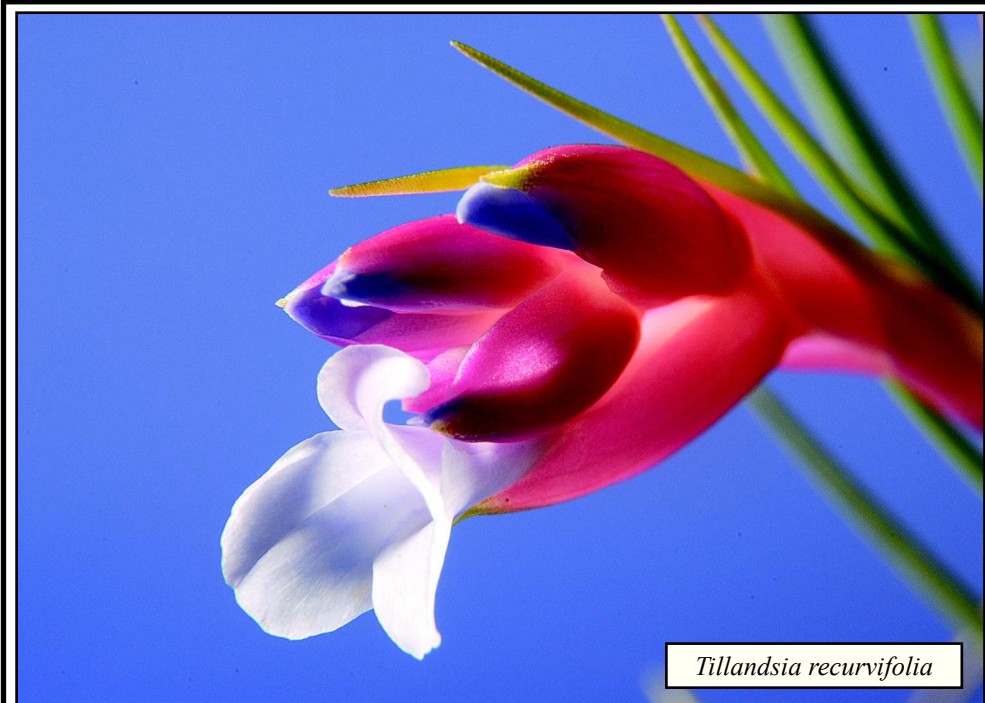
The epidermis of many plants grows attachments consisting of one or more cells and taking many different forms. These attachments are called trichomes (TRIH-combs), a word derived from Greek "hairy". The trichomes we are most familiar with are those which give plants a downy or furry appearance. *Artemisia* and the many other plants which grow under hot, arid conditions are covered with "hair" which protects against the glare of the sun, shelters against drying out in the wind, and, perhaps, helps to keep predators at bay.

A more aggressive defence is mounted by the stinging nettle. Under the slightest pressure the tips of its stiff trichomes break off, forming virtual hypodermic needles which inject the hapless intruder with its 'venom.' Trichomes can be utilised to help a plant climb, i.e. tendrils.

One of the most interesting and successful adaptations to a nutrition-starved environment is the development of trichomes in the sundews. These exude a sticky nectar to attract insects; which are then trapped and digested.

Bromeliad trichomes are complex cellular structures somewhat similar to an umbrella with a short 'shaft' of stalk cells and a "screen" being a disc-shaped shield. Fig. 1 shows the anatomy of a *tillandsia* trichome where the shield would lie fairly flat against the epidermis so that the leaf is smooth, perhaps with a slightly velvety touch as with *Tillandsia xerographica*.

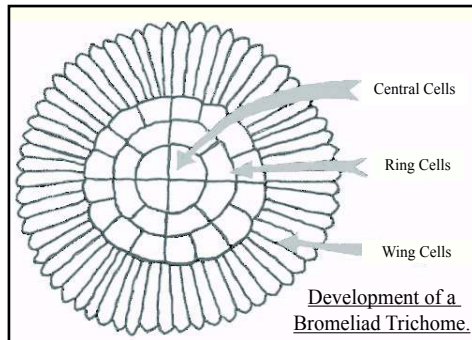
Not only does each bromeliad have its own unique trichomes, the trichomes on the upper (adaxial) side of the leaf are different from those on the lower (abaxial) side of the



Tillandsia recurvifolia



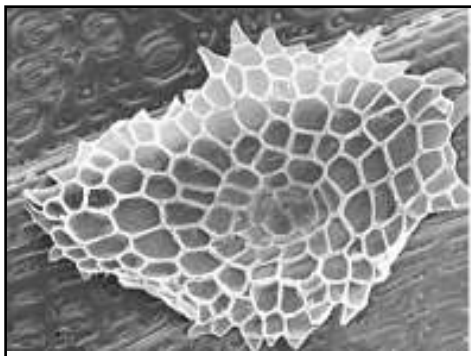
Guz. sanguinea 'Tricolor'



leaf. Trichomes may be symmetrical about the stem cells or strongly asymmetric.

If the shield edges turn up, the leaf surface will be rough as in *Tillandsia ionantha*. The disc may be more fully developed on one side, producing a fuzzy surface (*T. crocata*). Extreme development is found in the hair-like extensions of the trichomes of *T. tectorum*.

Bromeliad trichomes modify the ultra-micro climate of the leaf, and have three important functions: to protect the plant from too much sun, to acquire minerals, and to acquire and conserve moisture. Tillandsias (and other bromeliads) which grow in a shady, humid environment have fewer trichomes than those exposed to full sun, and are green. Depending on the amount of sun exposure to which the plants have adapted, the density and extensions of the trichomes cause the leaves to appear grey, silver, or white



Bromeliaceae

The cells of the extensions are hollow, so that they reflect light (up to 45%) and form a good insulating barrier. When the leaf is wet, the cells fill with water and reflect very little light; and the leaf appears green. The trichomes channel water very quickly through the stalk cells into the leaf interior but prevent water (water vapour) from escaping. With good air circulation, the trichomes quickly dry out again and the plant regains its normal grey to silver lustre. (Note that not all bromeliad trichomes are hydrophilic as described above. In some species, the trichomes are distinctly hydrophobic and these show no change in appearance when 'wetted'.)

As a consequence of the rapid absorption of moisture by the trichomes, bromeliads, and in particular the extreme epiphytes, respond to foliar fertilisation.

Bromeliad trichomes have evolved in distinct patterns that are sufficiently distinctive to be useful in plant identification at least to the sub-family taxon.

(Compiled from 'The Biology of Bromeliads' by David H. Benzing; and numerous internet sites)

Fruiting Bromeliads

Author: Carol Johnson

Reprinted from *The Newsletter of the Florida Council of Bromeliad Societies, Inc.*, February 1989

Fruit. The fleshy ripened ovary of the flower, enclosing seeds.

Berry. A many-seeded succulent fruit.....
A Dictionary of Biology; M. Abercrombie et al]

We have all read articles regarding the colour of bromeliad berries and nearly every day we encounter the pineapple (*Ananas*) in some form. We have also been regaled with theories which purport that the



Guz. sanguinea 'Tricolor'
old mother



Guz. sanguinea var *tricolor* up plus old
seed pod



Guz. sanguinea 'Tricolor' parent plant
showing small pup just starting to sprout.
The image of the mother above shows a
plant that looks spent. This shows how
important it is to be careful before throw-
ing out the old mother

brilliant foliage and bizarre markings of the plants are nature's way of attracting pollinators to the blooms. Little has been said about the bromeliads with insignificant blooms and ordinary green foliage which nearly always self-seed and in the process produce spikes of fruit (berries) of incredible and long-lasting beauty.

Birds and other predators are attracted by the fruit, eat it and leave their droppings in various places where the seeds sprout and the habitat of the bromeliad species is expanded. Plants produced from these self-seeding species nearly always come true to the parent; and all are in the subfamily Bromelioideae, and the majority are Aechmeas.

Then, there are bromeliads that may or may not self-seed and when they do, the progeny bear only slight resemblance to the parent. I am thinking, in this regard, of *Aechmea chantinii*, *Aechmea zebrina* and many *Aechmeas* in that related subgenus, *Platyaechmea*. I suspect that ants are the pollinators of these plants in my greenhouse and no longer attempt to grow seeds produced by *Aechmea chantinii* and *Aechmea zebrina* as the product may be hundreds of dissimilar seedlings. It is possible to isolate, hand pollinate and tie off the blooms, but then we are no longer discussing a natural occurrence.

In the interest of conserving space, many growers have discarded those bromeliads which have insignificant blooms and thus are not aware that they are missing the most beautiful stage of the plant's life span. Listed below are those that I grow strictly for the beautiful spikes of berries. There are many more, but these are my favourites:

- *Aechmea pubescens* has whitish yellow flowers followed by often two-foot-long spikes of geometrically arranged blue seeds (if fertile) that stay in color several months.
- *Aechmea mexicana*. This plant also has spectacular red foliage when grown in

strong light, but here again the insignificant panicle of blooms is followed by berries that progress through white to blue.

- *Aechmea lueddemanniana*. Pink flowers followed by blue, viable seed pods.
- *Aechmea angustifolia*. This plant is quite variable, but the bloom spike is a dense cylinder of yellow blooms followed by large blue, white, and/or yellow seed pods.
- *Aechmea bracteata*. This aechmea can also produce red foliage in strong light, but the most spectacular spikes of red and green berries are produced on fertilized plants which then produce larger bloom spikes. The berries eventually turn black.

The accompanying table details those plants that come to my mind as belonging to the desirable fruiting category. Most of the plants listed here are rarely seen in shows, blooming or non-blooming, as their decorative value is negligible. When in berry, they stand little chance in the blooming section of a show (where the rules say they must be entered) since the foliage is then past its prime and the plant has probably already produced several offsets. Consequently, the public rarely sees fruiting, decorative pineapples, *Portea petropolitana* with its handsome blue fruit, *Areococcus flagellifolius*, *Xanamea* 'Scorpio', and the like.

Many hybrid aechmeas have attractive berries which are usually not viable. Examples: *Ae.* 'Royal Wine', *Ae.* 'Foster's Favorite', *Ae.* 'Valencia'

Many aechmeas produce berries that turn dark (usually blue or purple) only if they are pollinated and contain seed.

(See over page for table of bromeliads that produce outstanding fruit. - Ed)

Don't forget the Bromeliad Society of Queensland Christmas Party:

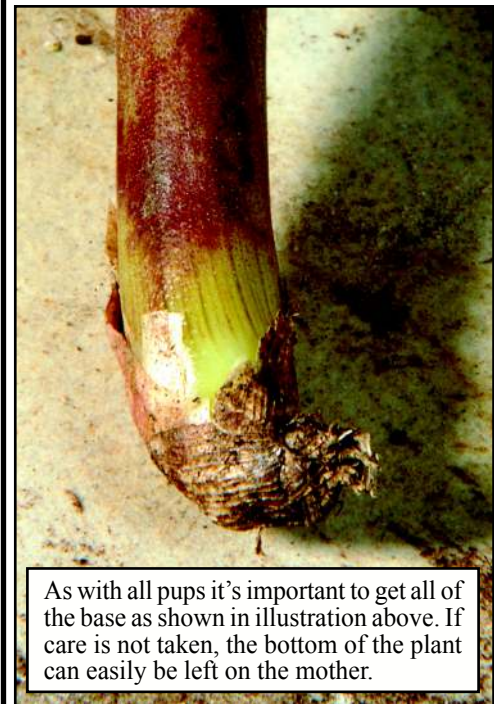
December 6th



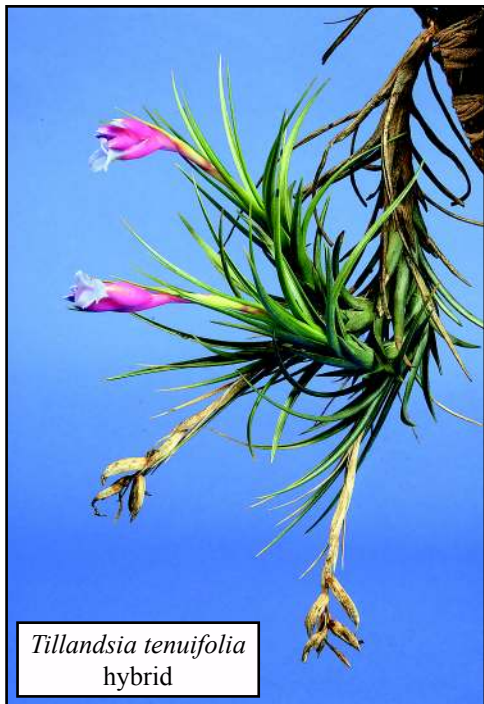
Alcantarea burle-marxii with adventitious pups growing from base



Alcantarea burle-marxii pup taken from mother at left.



As with all pups it's important to get all of the base as shown in illustration above. If care is not taken, the bottom of the plant can easily be left on the mother.



Tillandsia tenuifolia hybrid

Bromeliads with Outstanding Fruit.				
Plant Name	Foliage	Plant Size	Blooms	Berries
<i>Aechmea</i>				
<i>allenhi</i>	green	small-medium	pink	pearl white, blue if fertile
<i>angustifolia</i>	green	medium	yellow-green	blue
<i>bracteata</i>	green	large	yellow-green	red/green to black
<i>castelnavii</i>	green	large	pink-white	black
<i>chantinhi</i> , var. <i>chantini</i>	green	large	yellow-orange,	red & white, blue if fertile
<i>dactylina</i>	green	medium	yellow	blue & white
<i>dichiamydea</i> var. <i>trinitensis</i>	green	large	blue-purple	blue
<i>flicaulis</i>	green/red	small	white	blue/white
<i>fulgens</i>	red-green	medium	blue	red
<i>lingulata</i>	green	large	pale yellow	purple / black
<i>lueddemanniana</i>	green/red	medium/large	lavender	blue & white
<i>mertensii</i>	green	small	yellow	blue & white
<i>mexicana</i>	green	large	rose	pearl/blue
<i>nudicaulis</i>	variable	small/large	red/yellow	red
<i>penduliflora</i>	green/red	medium	yellow	blue & white
<i>pubescens</i>	green/red	medium	yellow/white	blue
<i>racinae</i>	green	small	yellow	red/orange
<i>recurvata</i>	green	small	red	black
<i>retusa</i>	green	large	orange/red	orange/red blue-violet if fertile
<i>servitensis</i>	green	medium	yellow/orange	pearl
<i>tillandsioides</i>	green	small/medium	yellow	blue
<i>tocantina</i>	green	large	orange/yellow	orange
<i>tonduzii</i>	green	medium/large	yellow	black
<i>victoriana</i>	green/red	medium	blue	purple/black
<i>Ananas</i>	various	small/large	yel./red/blue	edible fruit
<i>Billbergia</i>				
<i>viridiflora</i>	green/red	medium green	orange	
<i>Bromella</i>				
<i>balansae</i>	green	very large	red & white	yellow
<i>Neoglaziova</i>	banded	small/medium	red	maroon
<i>Portea</i>				
<i>petropolitana</i> var. <i>extensa</i>	yellow/green	large	lavender	purple
<i>xAnamea</i>				
<i>Scorpio</i>	variable	small	yellow	bronze

Can You Help Out a Fellow Member?

Ed. - Recently I received the following email and I have reprinted it here because I believe that there is a large unmet demand amongst many of the society members who live in non-metropolitan areas. Those of us who are fortunate enough to be able to attend the Society's monthly meetings which include plant sales tables have ready access to a large variety of plants at a reasonable cost. This is often not the case for many members.

Here is the email I received:

"Recently I became a member of the BSQ - and besides my subscription I purchased some of the old Bromeliaceae magazines. Today I was reading Nov/Dec 2005 and you wrote an article with a suggestion to people to sell offsets rather than advanced plants. My ears pricked up - and I thought that if you still agree with that idea, maybe you might sell me some offsets.

I have been buying fairly well advanced "pups" at \$15 each by mail so it is a quite expensive way for me to enlarge my collection.

I would be happy to buy small pups at around the \$3 mark. Of course I would pay postage and packaging costs to Yamba.

If you are agreeable - maybe you could send me a list of some of the Broms that are available at the moment.

I hope you will be able to help me BUT if not that's fine.

Look forward to hearing from you.

Regards Nola Mauler

nolamauler@bigpond.com

I suggested to Nola that I publish her email and felt sure that there will be members willing to help by contacting her at the email address above.

Bromeliaceae

Calcium Nitrate

Peter Paroz

Calcium nitrate is an ideal source of nitrate nitrogen and calcium. It is very soluble in water and both nutrients are readily utilised by bromeliads either as a foliar spray or soil application.

It is available in two powder forms:-

- Anhydrous calcium nitrate
Ca (NO₃)₂ 100 % calcium nitrate
39.2 % calcium 13.7 % nitrogen
- Hydrated calcium nitrate
Ca (NO₃)₂.4H₂O
58.6 % calcium nitrate
22.9 % calcium 8.0 % nitrogen

Fertilizers are required to have the analysis included in the labelling so it is easy to see which form is available.

Calcium nitrate is quite hygroscopic - it absorbs moisture from the atmosphere sufficient to go into solution - so the powder should be kept in an airtight container.

If it does dissolve, the solution does not 'go off'. One ml of the solution contains

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about the same amount of calcium and nitrogen as one gram of the hydrated material or 0.6 gram of the anhydrous form.

Calcium nitrate can be safely mixed with other soluble fertilizers to modify the NPK Ca Mg ratio, but should be diluted before mixing. As a general rule, it is not a good practice to mix concentrated solutions of different fertilizers as odd effects may occur with some combinations. These are not harmful or dangerous but the solubility of some nutrients may be affected. As a precaution, only mix fertilizers or ingredients as dilute solutions ie weaker than 0.5%.

Ed - Peter is a former industrial chemist and we are lucky that he took the time to research this topic.

Growing on Bromeliad Seedlings

By John Catlin.

Reprinted from the Central Coast NSW Bromeliad Society Inc's Bromelia Post, January 2006 issue, which in turn was reprinted with acknowledgement to Bromlink, the September/November, 2004 issue of the journal of the Gold Coast Succulent and Bromeliad Society.

Most people understand that seed should not dry out or it will die. This same principle applies to seedlings that have been transplanted into their next container. The moisture level of the soil and the humidity level surrounding the seedlings is critical, not too wet for long periods or they cannot breathe, too dry and they dehydrate. Another point is that most understand that bromeliad seed is sown on the surface of the seed-raising mix. However, often when the seedling is potted up, it is buried with the growth eye below the surface of the soil. This is respon-

sible for most deaths. The growth eye should be level with the surface or just above it. If the seedlings don't stand up, support them with bamboo skewers.

How about writing an article for this Journal

Author: Ross Stenhouse

If you look at the name of the author on the articles published in this edition, unfortunately you will find my name on many.

I am not an expert on horticulture (although my knowledge is rapidly increasing because I research many of the articles I have had to write and because I read every article I publish - every single word). There is so much information contained in these articles, some is suitable for the raw beginner (which once we all were) and some is targeted at the more experienced grower.

The point I am driving at is that I need articles for the journal. You don't need to have the technical knowledge of a Bob Reilly, Derek Butcher, Rob Smythe or Peter Paroz, you can write about what interests you in the world of bromeliads.

I know from the feedback I receive that people really like reading stories that have a high "human interest" aspect to them. Some members take their involvement with bromeliads extremely seriously, they are true experts in the subject. A few members like myself are technicians, we enjoy the scientific aspects of growing bromeliads, most members are interested in having beautiful bromeliads growing in their gardens.

With a readership demographic like that there is a lot of room for someone like you to write a short (or long) article for publication. You can almost be certain that amongst the 540 members of the society there is bound to be members who will enjoy it!



Four-Headed *Aechmea fasciata*

I'm not sure if it is of any interest or not, but I have an *Aechmea fasciata* that had four separate heads on four separate stems in the one vase.

It seems most unusual to me, however it may not be all that unusual at all. You are welcome to use it if it is any use to you. I haven't done anything different to the plant to write up anything about it for you. If you have any questions please feel free to ask.

Regards,
Margaret Kraa.

Orthophytum gurkenii

What a quandary this plant has been over the years. I have been asked so many times, "How do you grow it?" My answer used to be, "It looks like a succulent so try growing it dry". I did cover myself by saying that it never grew well for me. I do know that one person in Townsville grows it dry but very close to his swimming pool. The above advice is all wrong and I will explain later.

Why should we be confused? Well the early literature is confusing enough. It says that it was discovered in 1991 and pressed and described 10 years earlier. Actually pressed in 1981 and described in 1982. Typo I suppose. They say it does not pup readily. If I can get a photo of a friend's plants which probably shows 30 plants with 150 pups, you can see for yourself how crazily they pup. Definitely a job for the lawn mower in Townsville. It's the Triffid of the Bromeliaceae Family.

Bromeliaceae

Successful growers grow them very wet. The first I heard about this was at a conference, where we were sitting around a table and one person said she grew orthophytums like weeds. How? "Fill a foam box with water and place them on an upturned pot sitting them above the water." Curious, so I started to read and I found that they grew on rock faces. *Orthophytum gurkenii* was originally found growing only on one 100 m by 100m rock face in Brazil, which makes them very vulnerable to extinction in the wild. I was reading a book I think about Venezuelan bromeliads and they spoke about orthophytums growing in very wet crevices in rock faces.

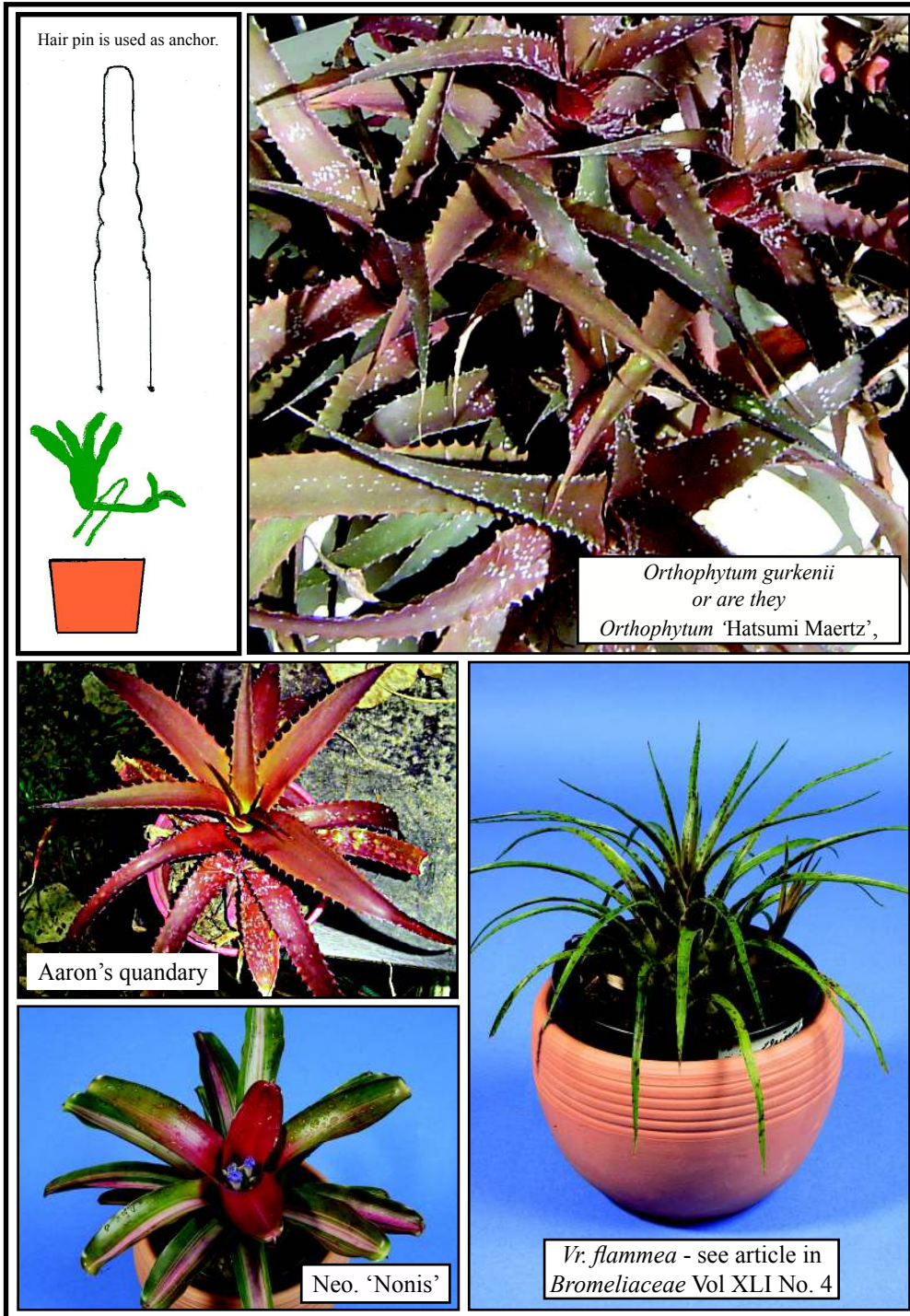
So, you that know me know I have to try everything. The following would be difficult to believe if there was no photo to back it up. My wife, Gwen, bought a little fountain thing for the garden. No fish of course as it is another place for me to grow my mosquito predators for my broms. That's believable but in addition I removed two *Orthophytums* from my wet bush house and without soil dropped them into this pond as water plants. The lower stems and roots are completely submerged and they have grown there, extremely well, for the past year. See photo.

Rob Smythe

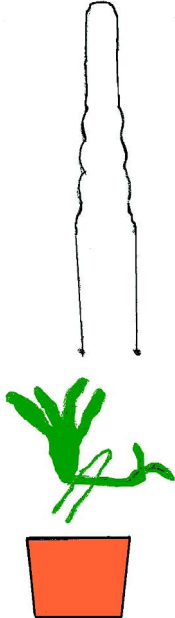
More News from Dalby

Since the lovely rain about six weeks ago there is a mat of green around my chookpen shade house and also in the paddocks. The tree behind the shade house has recovered as well, although others have not. Things are drying out now quickly again with the hot weather.

Our dam we use for house and garden water has run out but we have bought a share



Hair pin is used as anchor.



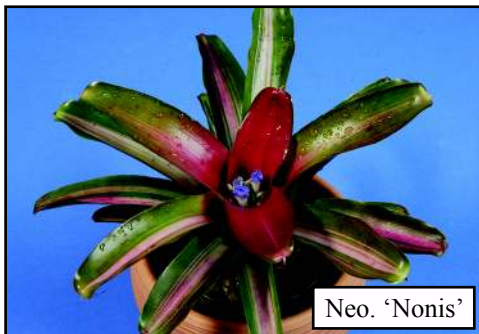
Orthophytum gurkenii
or are they
Orthophytum 'Hatsumi Maertz',



Aaron's quandary



Vr. flammea - see article in
Bromeliaceae Vol XLI No. 4



Neo. 'Nonis'

in an artesian bore next door, courtesy of a very nice \$4 scratchy win just at the right time, and piped the water three miles to the house. I am now using that on the garden and it is the first time since 1968 that I have had clean water in my house.

My broms are now lovely and glossy. It is wonderful, but I am not sure about the long term affects. The water analysis shows that it is fairly salty (although it tastes good) and the ph is 8.9. My soil already has a high ph. For those who know something about it the worst part seems to be the high sodium absorption ratio, which is the ratio of sodium to calcium and magnesium, and this may cause soil permeability problems.

The bore water has increased the colour in my broms considerably so I will just have to wait and see what happens in the future.

all the best

Penny Murphy

A Quandary about *Orthophytum gurkenii*

With reference to recent stories in Bromeliaceae I have a little more to add.

In tropical North Queensland there is no problem growing these plants and I have a hint for Ross, I too have found that anchoring the base of the plant in the potting mix is beneficial when starting off viviparous offsets. You don't always have a piece of stem to bury.

The old fashioned hair pin (shaped like an elongated letter U) and still available in Pharmacies does the trick admirably. The hairpin anchor I have devised is a method of anchoring small plants into the potting mix, as you have probably noted, as long as these small offsets sit around on top of the mix they do not make any roots.

The pin is inserted through the bottom of the foliage, the fleshy part at the base of the

plant or straddling the stolon and pushed into the mix holding the plant firmly. One or two pins can be used although I find that one is usually enough. Wire can be used but I find the wavy arms of the pins hold better.

There are two sizes of pins, the largest is best, smaller ones a bit too frail.

I have had *Orthophytum gurkenii* in my collection for a number of years but something funny has happened. Looked high and low for *O.gurkenii* and couldn't find one. Instead there were lots of what look remarkably like the hybrid *O. 'Hatsumi Maertz'*, I have never acquired the latter plant so where have all my *Orthophytum gurkenii* gone?

Numerous seed pods appear on my plants thanks to the bird life in the garden but I've not grown any *Orthophytum* from seed.

Is this then a case of the plant reverting, if so, to what?

Pat Coutts

Mt Elliot Q'ld.

Ed Since this email from Pat, I have received the following update from Rob Smythe

Hi Pat, Ross,

Not quite related to your story but I thought you might be interested. Re all Pat's *O. gurkenii* going bald. At my son's in Cairns on the weekend and noticed his *Ortho mertensis* (what ever its name is) going bald. I did not have my camera. Aaron has just photographed and sent photos to me. Attached. Won't bother you with another photo but when I came home I looked at my plant and it was the same except it was much more advanced into flower. All the bald leaves are actually bracts on the flower stalk. Looked at *O gurkenii* and this did not happen. Bracts had same scurf patterns as leaves. Doesn't help Pat's story much but interesting.

Rob Smythe, Townsville Q'ld

Ed This plant looks like my Orthophytum 'Starlights' which does lose its spots on occasion.

***Vriesea* 'Nigra' et al**

by D Butcher

The only *Vriesea* 'Nigra' in the Bromeliad Cultivar register is a form of *V. splendens* whereas the plant wandering around northern NSW and Queensland with this name seems to have links with *V. ensiformis*. Looking at the Olive Branch catalogue in 1993 we see 'Nigricans' ('Nigra') suggesting these names are synonymous and a note that this appears to be an *ensiformis* hybrid. The hybrid 'Nigricans' was created in France somewhere between 1895 and 1900 by Duval. In Duval's writings see 'The Bromeliads' by Duval published in 1990 by Big Bridge Press, Pacifica, California (This is based on the French book published in 1896) we find some intriguing information. The parents of this hybrid are 'Kitteliana' x 'Rex' which means you would expect a compound inflorescence.

In Revue Horticole 77:254. 1905 under Societe Nationale D'Horticulture de France you find that Duval and his son from Versailles showed a beautiful Bromeliaceae hybrid called *Tillandsia nigricans* whose bracts were a curious dark colour. That was all! although it was pointed out it was different to *Tillandsia nigrescens*! I thank Leo Dijkgraaf from The Netherlands for foraging for this material even though it was in French.

In 1935 Mez published his Das Pflanzenreich which is mainly in Latin but this is what he says about now *Vriesea* X *nigricans*. Refer Revue Hort 1905 so clearly he had not read the French book in 1896 and then he says "plantam colo; analysis ex vivo" which my crude translation means that they had the live plant and guessed its parentage as *V. rostrum-aquilae* x *ensiformis*. The plant in front of Mez must have had a single spike

and this could have been up to 40 years after the hybrid was created! This parentage was accepted by Lyman Smith. If such a plant is living today It would have had to survived two World Wars. BUT, what does the plant look like?

Back to my problem. Over the years I have pondered over a *Vriesea* 'Rubra' I got from northern New South Wales and a *Vriesea* 'Nigra' I got from the Brisbane area.

The one I got from NSW was called *Vriesea rubra* (a species name) but as soon as it flowered I knew this was wrong because coming from Venezuela and neighbouring countries I should not have been able to grow it in Adelaide. I could never decide if my plant was 'Nigra' or 'Rubra' because each year they seemed to flower differently – sometimes with dark red floral bracts and sometimes with not so dark red floral bracts. Was it a shade problem? Both named plants seemed to have some link to *V. ensiformis*!

BROM-MAD

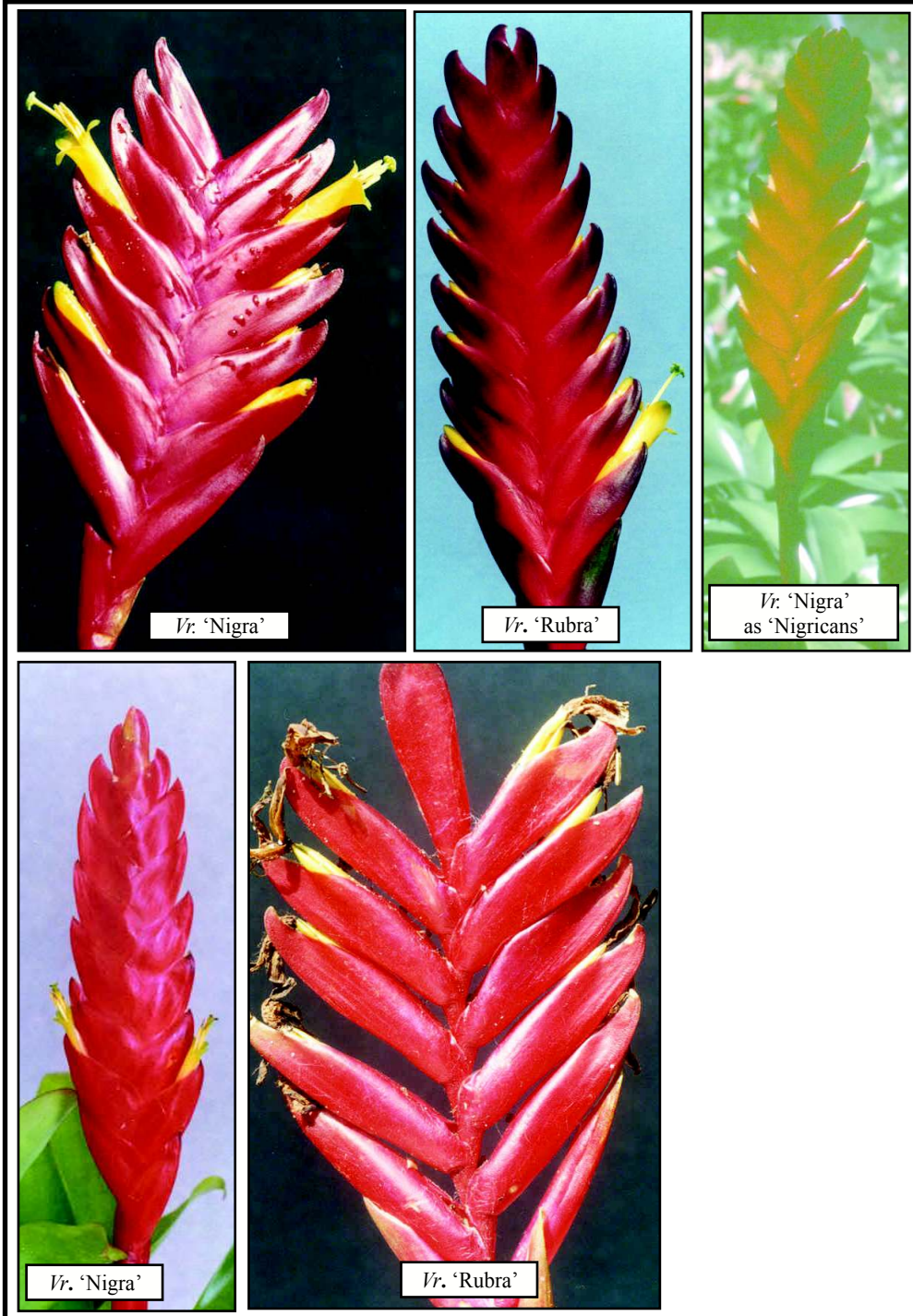
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Bromeliaceae

29

Sept/Oct 2007

This is how Peter Huddy of Adelaide described his 'Nigra'

Parents unknown

PLANT stemless, 200-300mm high, 450-600mm high including inflorescence.

LEAVES about 35-45, forming a rosette 450-600mm diameter, curved outwards, 300-400mm long, light green, glossy both sides.

SHEATH 50mm wide, tapering to blade:

BLADE strap shaped, 35-40mm wide, sharply tapered to point. **SCAPE** erect; 350mm long, 6mm diameter: **SCAPE BRACTS** 50-60mm long, longer than internodes, adjacent to scape, 6mm long point on tip, free of scape, lower bracts green, middle bracts red base with green tips, upper bracts entirely red.

INFLORESCENCE 200-300mm long, simple, spear shaped, 75-85mm wide at widest point, with 18-25 flowers, bottom one sterile.

FLORAL BRACTS boat shaped, 55-65mm long, tapered to point, overlapping, dark red, outer part of fold almost black at tip, flowers free of bract for last 10mm.

SEPALS red with yellow ends, 6mm shorter than bract.

PETALS 15mm longer than sepals, yellow, green tips, tips flared.

STAMEN 15mm longer than petals.

PISTIL same length as stamen.

Let us now return to the Olive Branch catalogue of 1993 where we have a *V. ensiformis* var. *rubra* but there has never been a variety of this name so it is clearly a nurseryman's name. Could this be the reason why there are plants around called *Vriesea* 'Rubra'?

Let us now do a bit of lateral thinking. There is a *Vriesea* 'Rubra' named by Richter in the 1950's but he never divulged parentage. It was quoted by Padilla in J. Brom. Soc 10:39. 1960 but was it being grown in the USA? We know he used *V. ensiformis* in his

hybrids because he created *V.* 'Favorite' The only photo I have of this cultivar is that from G. Samyn of the Belgian Research Institute and as such should be fairly authentic. In this regard the Olive branch catalogue says they have several forms of *V.* 'Favorite' and I can only assume from this that someone has been growing seed from this hybrid rather than waiting for offsets!

Could there be a similar happening with seed being grown on from Richter's 'Rubra' and the resultant differences causing problems with some offspring being called 'Nigra' for want of a name. We know that at least Peter Franklin from Raymond Terrace, NSW grew seed called 'Nigra'! Or is it someone's misreading of a scrawled 'Rubra' on the label.

At the moment I am plumping for a connection with 'Richter's *Vriesea* 'Rubra' unless I can get some concrete refuting evidence. Is it the same as Olive's *V. ensiformis* var. *rubra*?

May I suggest that this would make an ideal subject for your Study Group?

What are the Americans writing about?

Author: Ross Stenhouse

The Society receives journals from many Bromeliad Societies based in the USA. There is a common thread running through the articles in many of the journals.

There have been a number of articles published about preparing bromeliads for the cold winters many of them experience.

Another topic gaining a lot of attention is about the "Evil Weevil" or more specifically the Mexican weevil. The weevil is "quietly munching its way through the neighbourhoods and forests in South Florida on a strict diet of bromeliads".



Cultivars

by Chris Larson

Reprinted from the August - September 2007 edition of "Bromeliad Newslink" the journal of the Western Australian Bromeliad Society Inc.

I've had a couple of people come up to me recently with a lack of understanding of the nature of plant names, specifically with cultivars masking the identity of species.

This has become more important over the last number of years as there has been a number of members starting to collect species plants, rather than hybrids. Sometimes the rules by which our plants are named, under the International Code of Nomenclature for Cultivated Plants (ICNCP), create some confusion.

The term "Cultivar" is defined in the Bromeliad Society International publication "A Bromeliad Glossary" as: "A plant produced as opposed to one growing in habitat: a horticultural clone or strain. A plant type within a cultivated species that has recognizably different characteristics."

Most of us understand cultivar to mean the plant produced in cultivation such as hybrids or sports. Many don't consider the second part of the definition where it can mean a particular form of a species, which doesn't have the scientific criteria necessary to gain the status of a variety; or even assume the title of a "forma". The ICNCP rules state that all genera, species, varieties and forma names are Latinised, and that all cultivar names are not to be Latinised, (although it was usual to Latinise cultivar names until early last century). The rules also state that where a cultivar name is used, the species name should not be included.

So the upshot of all this is that where we have a naturally occurring species, like

Tillandsia Druid, many may mistake it for a hybrid. *Tillandsia* 'Druid' is a form of *Tillandsia ionantha* occurring naturally in Vera Cruz, Mexico, and is distinct in that the plant has white flowers and blushes yellow instead of red. Taxonomists don't consider it different enough to give it varietal status like *Tillandsia ionantha* var. *maxima*. Botanically the plant rates as *Tillandsia ionantha*. However, as collectors, sometimes we find the need to differentiate between different clones of a species, and as a result someone has registered the name 'Druid' for this plant.

Under the ICNCP rules, which the BSI follows, the plant becomes *T. 'Druid'*. Orchid societies do not follow the ICNCP rules and if it were an orchid, it would be *T. ionantha* 'Druid'.

When I write tags I often use the ICNCP rules, but at other times I write a tag "the orchid way" - especially I'm giving the plant away to someone else, as I feel that it conveys the identity of the plant more fully. However, when you are reading bromeliad literature, or buying plants, be aware that sometimes the name may not present all the information you are looking for.

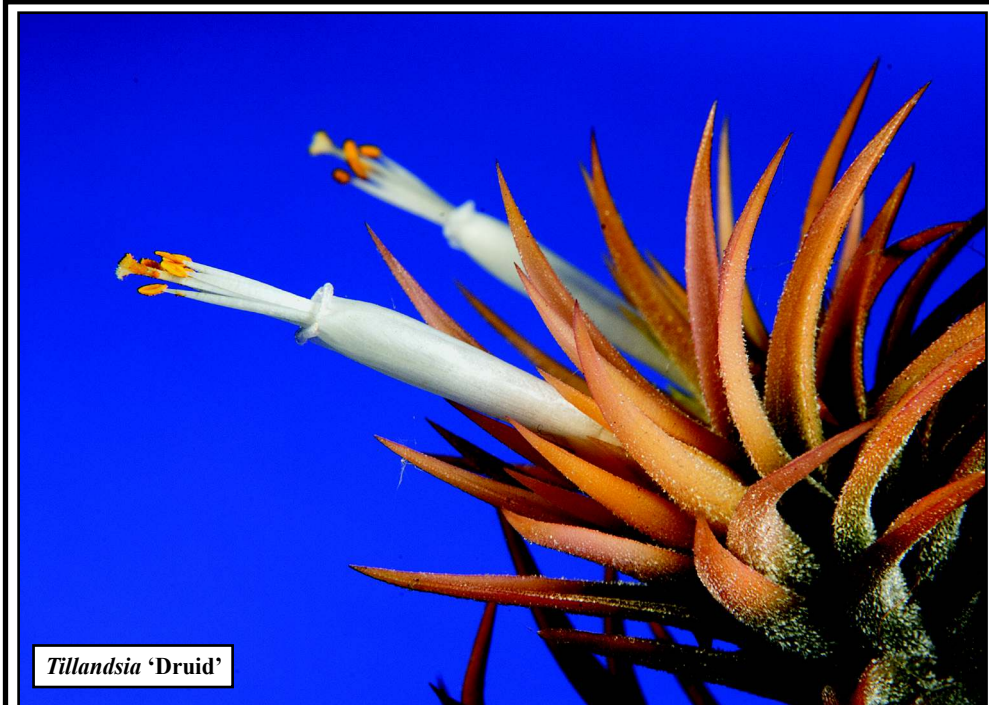
Bromeliad Curiosities

The first bromeliad to be introduced into Europe was probably the pineapple but the date is uncertain.

Well documented introductions are *Guzmania lingulata* in 1776, *Aechmea fasciata* in 1828 and *Vriesea splendens* in 1840.

A quality fabric has been produced from the fibre from the leaves of the pineapple plant.

In the local country markets of South America, fibre from *Neoglaziovia variegata* has been used to manufacture fabric, netting and rope. Source: Wikipedia



Tillandsia 'Druid'



Tillandsia ionantha

Caring for Tillandsia Clumps

Author: Len Colgan

This article is taken from the February 2002 issue of "The Bromeliad Advisory", the newsletter of the Bromeliad Society of South Florida and subsequently reprinted in the October 2004 Newsletter of the San Francisco Bromeliad Society and again reprinted in "Puptalk" the newsletter of the Saddleback Valley Bromeliad Society, California.

In the common parlance of Tillandsia taxonomists, there are "Lumpers" and the "Splitters". By these terms, it is meant to distinguish those that always look for similarities between two plants under investigation (hoping to prove that they are the same species or sub-species or linked varieties) from those who always look for differences, in the belief or hope that one of them is new.

However, in a different context, the language of mere collectors like myself involves the "Clumpers" and the "Dividers". The first term is commonly used to distinguish those tillandsia (and other genera) collectors who prefer to have their plants in large clumps rather than dividing them up on a regular basis. Those who have investigated my collection will definitely agree that I am a clumper.

However there are inherent risks in such an approach. When asked what are the most important aspects in successfully growing mounted tillandsias, I always respond with the following five necessities:

- Good fresh air movement;
- Good Light;
- Good fresh air movement;
- Regular watering; and
- Good fresh air movement

There are a number of species that I encourage to form large lumps. These in-

clude the common *T. aranthos*, *T. bergeri*, *T. crocata*, *T. ionantha*, *T. ixiooides*, *T. jucanda*, *T. juncea*, *T. magnusiana*, *T. paleacea*, *T. recurvifolia* (including var. *subsecundifolia*), *T. tenuiflora* and *T. xfloridiana*. These are invariably attached to natural cork and hung from mesh inside a shade cloth covered frame. In one situation however, tillandsias are hung from both sides of a common frame on shade cloth support and it is here that problems have arisen. At the end of the last wet winter, the back third of many large tillandsia clumps in this situation were found to be dead. I had to remove large dead sections from *T. aranthos*, *T. bergeri*, *T. stricta*.

Although one of the necessities, namely regular watering, had been available, it proved that adversely, good light and (most importantly) good fresh air movement were missing. Clearly all of the plants at the back of the clumps facing the shade cloth with plants on the other side were deprived of vital natural light and air and so rotted. No such problems existed for individual plants or sparsely growing specimens.

What should you do to avoid this? Assuming that you still wish to create large tillandsia clumps, I recommend:

- Before the wet season arrives, carefully remove old plants and leaves, especially near the centre of the clump;
- Place the clump in a situation that maximizes the light and the air movement from all directions.

In the future, all my clumps will be prepared for the wet season.

Ed - At the October meeting of the Society a very large clump of T. ionantha was on display. I was greatly impressed by its beauty and that prompted me to include this article in this edition. Obviously there are a couple of simple methods that can be applied to improve the results of the grower's endeavours



Tillandsia schiedeana



Neo. 'Fireball' striata

Ants as pollinators of Bromeliads

Author: Ross Stenhouse

At the October meeting of the society, Rob Smythe gave a short presentation about bromeliads growing in his garden in Townsville. Rob hybridizes Neoregelias and in what was almost a passing comment, he made the statement that you need to be very careful because ants will fertilize the flowers. I remember thinking that I hadn't seen any ants in my neoregelias and anyhow if the cup of the plant had a lot of water in it, the ants would have difficulty in getting to the flowers.

A week later I noticed some very nice flowers in a couple of my Neoregelias. I must confess I find it difficult to pass up an opportunity to 'get in close' and photograph very small flowers. Technically they are a challenge, the field in focus is very small, so you have to use small apertures to get the maximum depth of field.

Apart from the technical aspects, you can see features of the flowers that are too small to see with the naked eye. I find this very interesting and I enjoy showing others the images I have created.

Here in S.E Queensland October and November see bromeliads maturing and coming into flower and in recent years we seem to have witnessed an explosion in the ant population.

When I took the first close-up image I noticed that there were ants in the flowers. The ants were very small, about one millimetre in length.

The challenge became to get a close-up of any of my Neoregelia flowers without these very small ants getting into view. The difficulty is they are so small they are very difficult to see with the naked eye, but I am

sure they will result in fertilization of the flower.

I was interested to know what species of ant they were and so I looked up the Internet for ants in Queensland.

What I found was an ant species called the 'Minute ant' - *Plagiolepis allaudi*. These very small, golden brown ants are about one mm long and can be difficult to see. They nest in soil but will forage in buildings. Minute ants take a variety of foods, scavenging on dead insects, dried dog and cat food, and in the sugar bowl. (www2.dpi.qld.gov.au/forestry/5015.html)

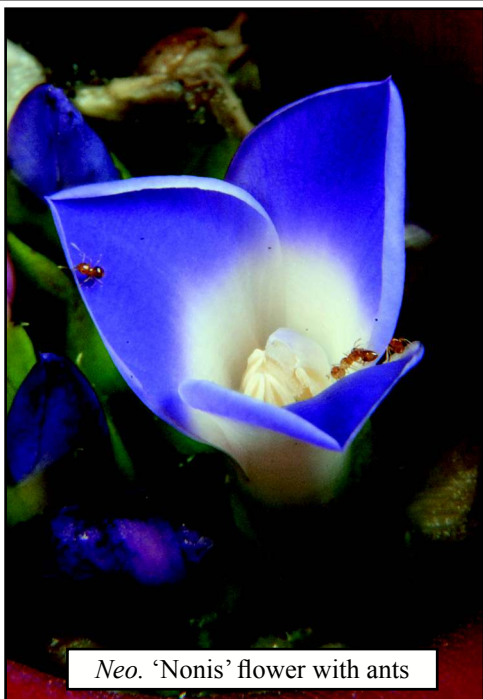
Previous to hearing about (and seeing) ants as pollinators of Neoregelias, I hadn't bothered to collect seed. Not knowing what the pollen parent was could be a pain, but then on the other hand it could be a blessing. I think I may look to see if these flowers become fertile and if so, try growing the seeds.

Aechmea miniata var *discolor*

author: Ross Stenhouse

Aechmea miniata var. *discolor* About 10 , 8 cm wide leaves form an open, semi-erect rosette approximately 50 cm across. The top surfaces of the leaves are pale green in colour with a faint pink tinge at the very edge of the leaves. The bottom surface of the leaves is a mid reddish in colour with heavy silver scurfing. The leaves are slightly translucent and depending on the surface being viewed, the reverse surface colour can be slightly seen. The plant prefers shaded conditions and the leaves are easily burnt by the sun. There is no natural distribution of this plant, it is known in cultivation only.

This was one of the limited number of bromeliads available in Australia during the



Neo. 'Nonis' flower with ants



Ae. miniata var *discolor*



Neo. 'Fire Wheel'
This hybrid is unstable and the colours vary considerably



Ae. 'Red Ribbon'

early days (1950-1960's). The plants I have were planted in my yard during that time and have been continually there since. The plant is common in gardens containing bromeliads about Brisbane, however is seldom seen on the sales tables of the society.

I have had one growing in regular potting mix in a hanging basket in a heavily shaded area and it seems to thrive. If grown in a more shaded area the leaves darken in colour and the overall appearance of the plant improves. If grown under conditions that are too shaded, the leaves tend to grow strappy.

I like this plant and recommend it to the grower just beginning to grow bromeliads as this is a tough plant. To the more experienced grower it can be a challenge to get a well-formed plant.

Yet Another Detective Story

Author: Ross Stenhouse

My photographic endeavours often lead me into trying to solve some of the little mysteries I find amongst my bromeliad collection.

My latest mystery evolved from the fact that Spring here sees many bromeliads maturing and coming into flower. Now since my collection exists so I can take photographs, then a plant that has an interesting inflorescence or flower is bound to attract my attention.

What I found particularly interesting about this plant was that the flower was about 35 mm long and fits in with the general conformity of the plant (long and thin). Because of its size and its structure, the flower is very easy to see although not so easy to get an image that clearly illustrates those points (see images on the page opposite).

Another problem I faced was that

the plant label said "Neo. species ex Brasil - Marjories seed". Now that label is a good lead but for someone like me, not particularly informative in coming up with a species name as I don't have an encyclopaedic knowledge of bromeliads. However, I do have access to an expert, Derek Butcher. Derek often comes to my rescue with plant identification and for that I am very appreciative.

I sent Derek an email with the title "This may be a bit of a challenge".

I received a reply within twelve hours saying "That was easy! You would have noticed that the plant has longer petals than you expect in *Neoregelia*. It is in the sub-genus *Longipetalopsis*. I am sure the Marjories seed refers to Marj MacNamara and the enclosed should answer all your queries."

Here is the informative articles Derek enclosed with his email.

NEW NEOREGELIA SPECIES

by Derek Butcher in *Bromeletter* 37(4):2. 1999

The advantage of putting Selby numbers on your label is beginning to pay off. Those who have a *Neoregelia bahiana* Selby 036187 from Maurice Kellett can now change the name to *Neoregelia mucugensis*. Never heard of it? Well, there is quite a write up of this plant in Elton Leme's book "*Canistropsis*". What is a *Neoregelia* doing in a book with this title? Well, Elton is reviewing all of the plants in the *Nidularium/Neoregelia/Canistrum* complex but with this as a title it would no doubt have scared off potential buyers. So the "*Canistropsis*" book does contain *Neoregelia* and if you want to be more precise, the sub-genus *Longipetalopsis*. This name is obvious if you have flowered your new *Neoregelia mucugensis*, peered into its deep cup and seen the extra large bluish flowers. This plant is not a particular favourite of Margaret's because it seems to jump off the bench to spike her with its rather



Ae. ramosa 'pink form'

Neo. diamantensis

Neo. mucugensis

Neo. mucugensis

strong leaf tip!

How do I know so much about *Neoregelia mucugensis*? Harry Luther wrote to me about the good news of the plant that Maurice Kellett had sent him in 1992 and originally identified as *Neoregelia bahiana*. All we have to do is link the plant called *Neoregelia bahiana* var. *viridis*, which I understand, came to Australia via Peter Tristram with Maurice Kellett's plant.

While on the subject of *Neoregelia bahiana*, I am pleased to advise that a plant in this variable species is in Australia. How many of you have a label entitled 'Little Neo' we collected in Minas Gerais 1990 growing saxicolous beside a stream - high country - as bleached purple'? I got this plant many years ago from Marj McNamara and only this year did it finally decide to flower properly. I believe this is also the plant referred to by Ruby Ryde in 'Food for Thought' in Bromelletter 32(4), 1994.

Because it has two sorts of leaves, narrow for the outer ones and wide for the centre ones, I had always suspected it was *Neoregelia diversifolia* that was supposed to come from Minas Gerais also. However, we now know that *N. diversifolia* comes from Espirito Santo and if the leaves are short and narrow it doesn't matter. With the excellent drawings of the floral parts at the end of Elton Leme's book, I was able to check our own findings and could not get past *Neoregelia bahiana*.

The second article Derek enclosed is this one:

FOOD FOR THOUGHT

by Ruby Ryde, Bass Hill, N. S.W. in Bromelletter 32(4): 6. 1994

During our June 1990 collecting trip to Brazil, we visited many areas. Some out of curiosity as to what was left in old known collecting sites of the days of the Fosters and others. Many other places were suggested by

our guide.

One in particular he thought would please, was a small area in the mountains of Central Minas Gerais. He and a friend from the U S had some months earlier, found a delightful small, rather tubular *Neoregelia* growing on low rocks and leaf-litter nearby. The location had some tree cover giving a filtered light effect. Several pieces went back to the U.S.A. with the friend for possible identification especially by Harry Luther.

The plants on the rock dome, particularly the ones in the more exposed position, had a very definite flared top looking like an opening rose with a beautiful red tint. All the plants had the flared upper leaves to a certain degree, and the leaf litter terrestrial growing specimens resembled a *Billbergia* at first glance. All had long stolons.

For a long time I have felt I knew the name of this plant. A fleeting glimpse of Leme's slides at the last National Conference in Queensland, made me more sure.

The superb photography by Luiz Claudio Marigo illustrating the wonderful new publication by E.M.C. Leme and featuring a close up of *Neoregelia diamantinensis* truly convinced me that this is that plant.

Given the high altitude, rarified air and full mountain sun, all of this species would show glorious colour and form. The fact that our plants was some miles apart from the first discovered specimens and carry that place name means little I feel. They were in similar conditions and in the same state, and carry a strong resemblance one to the other.

In his wonderful new publication; "Bromeliads in the Brazilian Wilderness" E M C Leme writes of *Neoregelia diamantinensis* and I quote,... "*N. diamantinensis* was discovered in Diamantina, Minas Gerais. The shape, size and color of its leaves vary, etc."

Harry Luther, on seeing my plants

didn't comment; however they had long lost their newly collected appearance in quarantine, etc. I am striving to get that back again!!! None were in flower at the time of his visit. He did say he hadn't received any specimens from our guide's friend!

Some Tips for Growing Bromeliads in Tropical Queensland

The following is an extract from the latest (November) Brom Watch Townsville produced by Rob Smythe. Growing bromeliads in tropical north Queensland can be different to growing them in other areas and Rob has made a study of this - Ed.

Mosquitoes. None around. What a great mosquito free year. Had them for about one week during Spring high tides.

Colour Heat has arrived. If you have not put up temporary shade expect colours to fade. We should be looking at 70 % shade by now. If you have 50% shade cloth a second layer of 50% increases your shade to 75%. If you have 70% shade cloth a second 50% layer gives you 85%.

Some of my plants have no shade in the early morning and 90% in late afternoon. I spray to cool the plants up until the shade comes in to play. Cooling with a hose during hottest times will also minimise fading.

Solstice This is terribly important to growers in the tropics and I seem to be the lone voice in the wilderness trying to make growers aware of its importance. Solstice is near enough to Xmas day so the sun is over Rockhampton about that time. About a month earlier and about a month later, as my reckoning goes, it is over Townsville. For

the remaining 10 months it is to the North. This is very important to growers like myself using vertical shading such as trees. Plants for 10 months can be in shade and then, suddenly they get the sun on them for the hottest part of the year. Broms will adapt to more and more light with less and less dam-

Continued on Page 46

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What is a Dichotomous Sub-key?

Author: Ross Stenhouse

The question that most often faces growers is ‘what species or hybrid is that?’ This is where a dichotomous sub-key comes in handy. While keys can be written in layman’s language, most require a thorough understanding of botanical terms.

In horticulture, a dichotomous sub-key is a means of identification of plants by asking a series of questions in the form of a series of “If..... Then ... else go to” questions

In a dichotomous key, a set of objects,

such as flowers, reptiles or in our case bromeliads, are divided into two parts, not once, but several times. In fact, when you analyse the word “dichotomous”, it literally means to cut into two parts. “Di” means two, and “tomos” means to cut.

Subsets are formed so that we eventually create subsets containing one object, we group objects with similar characteristics into the same subset.

In this article I have used two examples

Continued on Page 43

Platyaechmea Key for Ecuador by Harry Luther

- | | |
|--|-----------------------|
| 1. Branches of inflorescence sessile | <i>tillandsioides</i> |
| 1. Branches of inflorescence pedunculate | 2 |
| 2. Primary bracts abruptly reduced in size toward the apex of the inflorescence. | 3 |
| 2. Primary bracts gradually reduced in size toward the apex of the inflorescence. | 4 |
| 3. Floral bracts only slightly exceeding the ovary in length | <i>chantinii</i> |
| 3. Floral bracts much exceeding the ovary in length, about 1/2 as long as the sepals | <i>moorei</i> |
| 4. Spike rachis broad, 4 - 7mm wide, excavated | 5 |
| 4. Spike rachis narrow, 2 - 3mm wide, angled but not excavated. | 8 |
| 5. Sepals asymmetrical. | 6 |
| 5. Sepals symmetrical. | 7 |
| 6. Floral bracts 12 - 20mm long, the apex straight; sepals 10 - 14mm long | <i>retusa</i> |
| 6. Floral bracts 23 - 30mm long, the apex cucullate; sepals 16 - 20mm long | <i>cucullata</i> |
| 7. Sepals 13 - 15mm long, exceeded by to slightly exceeding the floral bracts | <i>tessmannii</i> |
| 7. Sepals 15 - 18mm long, much exceeding the floral bracts | <i>manzanaresiana</i> |
| 8. Leaves conspicuously banded; floral bracts 25 - 30mm long | <i>zebrina</i> |
| 8. Leaves not banded, floral bracts 23 - 25mm long | <i>romeroi</i> |

It should be noted that sympatric species of *Aechmea* subgenus *Platyaechmea* in *Amazonia* appear to hybridise occasionally, making identification of some specimens problematic, if not impossible

Key to the Species of *Streptocalyx*

1. Inflorescence amply 3-4 pinnate; spikes very laxly 1-7-flowered; rhachis very slender; sepals 8-13 mm long including the 3 mm mucro; pollen 4-porate; ovules caudate-appendaged. Brazil.
floribundus
1. Inflorescence bipinnate or rarely somewhat tripinnate at base.
 2. Flowers polystichous (in more than 2 ranks); primary bracts not covering the elongate spikes. **'Brazil'**.
 3. Sepals free, 8 mm long, merely apiculate; inflorescence sparsely furfuraceous. *curranii*
 3. Sepals much connate, 7 mm long exclusive of the stout mucro; inflorescence densely lanate. *lanatus*
 2. Flowers distichous (or only 2 in a spike); primary bracts (at least the lower) exceeding the spikes.
 4. Floral bracts serrate or serrulate; sepals usually serrulate as well, 14-25 mm long; inflorescence densely ovoid.
 5. Spikes all 2-flowered, fasciculate; floral bracts tomentose-lepidote toward apex; leaf-blades 30 mm wide. Ecuador. *biflorus*
 5. Spikes (at least the lower) more than 2-flowered.
 6. Scape much exceeding the leaf-sheaths; leaf-blades to 50 mm wide. Colombia. *columbianus*.
 6. Scape very short; leaf-blades 4-30 mm wide.
 7. Leaf-spines mostly spreading; leaf-blades soft, 4-15 mm wide; floral bracts unlobed. Colombia to Guiana and Peru, Amazonian Brazil. *longifolius*
 7. Leaf-spines mostly recurved; leaf-blades stiff, 15-25 mm wide; floral bracts 3-lobed. Peru. *arenarius*
 4. Floral bracts entire.
 8. Floral bracts shorter than the ovaries, reniform, apiculate; inflorescence elongate. Colombia to Bolivia, Surinam, Amazonian Brazil. *poepigii*
 8. Floral bracts equaling or exceeding the ovaries.
 9. Primary bracts lanceolate to ovate, acute; inflorescence subcapitate to pyramidal.
 10. Sepals white-farinoso; inflorescence pyramidal. Peru. *fuerstenbergii*
 10. Sepals glabrous; inflorescence subcapitate.
 11. Floral bracts 10 mm long, broadly ovate. Peru. *brachystachys*
 11. Floral bracts 15-23 mm long, lanceolate to ovate. Ecuador. *geminiflorus*
 9. Primary bracts broadly ovate to suborbicular, rounded and apiculate; inflorescence mostly cylindrical.
 12. Upper (at least) primary bracts cucullate. Guiana, Peru, Amazonian Brazil. *poitaei*.
 12. Upper (and other) primary bracts straight or nearly so.
 13. Floral bracts acuminate; inflorescence farinose. Peru, Amazonian Brazil. *williamsii*.
 13. Floral bracts retuse; inflorescence ferruginous-lepidote. Amazonian Brazil. *murcae*

of sub-keys. There is no particular method for the structure of keys, that is left to the key author. The success or failure of the key is governed by how carefully the key author has constructed the key.

As can be seen by the examples, the

“Platyaechmea” key is easier to understand than the key structure used for “*Streptocalyx*”

The “Platyaechmea” key was developed because it was difficult to identify between of *Aechmea chantinii*, *Aechmea*

Continued from Page 43

zebrina, Aechmea tessmannii and Aechmea retusa.

If we look at the "Platyaechmea" key and attempt to use the key the approach to use is to start at the top question (1) of the key and answer the question, in this case if the answer was "yes" then the plant would be *Aechmea tillandsioides* if the answer is "no" then we go to the top question indicated by the number at the right side of the table.

We then continue answering the questions and going to the option or accepting the identification. The key is quite specific in that it has been developed to fill a specific purpose and identify between a set group of plants.

As can be seen from the two examples given, the keys usually are quite specific in the questions that are asked. This is necessary because the purpose of the keys is to differentiate between subjects are closely related. The less the difference between the subjects the more specific the questions and this usually means that the average person will find that the keys less useful.

I hope you have found this article a useful introduction to the world of dichotomous sub-keys. Its a difficult subject to describe.

November Bromeliad Bonanza a Great Success

The recent show and plant sales held by the Society at Mt Cootha was well supported. The recent rain and the overcast conditions are like contributors to that success.

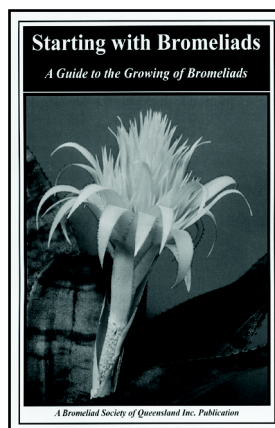
The commission from the plant sales is very important to the Society from a number of points of view. From my perspective as editor of this journal, they are particularly important as they provide the majority of the funding for the journal's production costs.

Apparently there were 6321 plants sold in two days, not a bad effort on the part of all involved. The success of the event was evident in the talk amongst those who were present at the tidying-up after the show. There had been speculation that with the drought playing havoc with gardens around Brisbane that there wouldn't be the demand for plants there had been in previous years.

This was not the case and growing bromeliads is more popular than ever!

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**How does
Platyaechmea fit into
the *Bromeliaceae*
Family Structure**

Author: Derek Butcher

Bromeliaceae is a family. *Pitcairnioideae*, *Tillandsioideae*, and *Bromelioideae* are sub-families.

Each of the sub-families have genera. *Aechmea* is one. *Aechmea* has sub-genera and *Platyaechmea* is one of the sub-genera. *Streptocalyx* was a genus under *Bromelioideae* but was considered to be really an *Aechmea* and lost its status.

It is now treated in the *Aechmea* sub-genus *Aechmea*. This subgenus is the dumping ground for all *Bromelioideae* plants that cannot be fitted into other genera!

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age but plants growing on the southern side of vertical shade, such as a house or a tree, will never adapt. You must provide temporary shade. Potted palm trees can be moved in or temporary shade cloth put up.

Growing Season. For our *Neoregelias*, *Billbergias*, *Aechmeas* and *Nidulariums* the growing season is over unless you are an extremely heavy waterer. *Vrieseas*, *Guzmanias* and *Tillandsias* will go on growing. The nights are now too hot in the tropics for photosynthesis by CAM plants to occur.

Next growing season is when the wet arrives. Water pressure in the plants will reopen the stomata (pores) enough to start off photosynthesis again.

You might think this is a good time to fertilize. I say no, fertilizer season is only when days are bright and nights are cool or when it is very wet and days are bright.

During some wet seasons it rains at night and sun is out in the day. These days of course it would be OK but generally the wet season is overcast and when plants do grow they are searching for light and grow strappy.

This is one advantage in having potted plants rather than in the ground. You can stop fertilizing the ones in pots. Won't affect large plants much but young plants will lose their shape but if you like 'big' this will compensate.

Bromeliads Used in Christmas Tree Decorations

I found this unusual suggestion on the internet (<http://www.bromeliad.com/23/bromeliad-used-in-christmas-tree-decorations/>) whilst I was undertaking a bit of research. There was a colour photo included in the page. Ed.

The holidays are not too far away!. Soon everyone will be venturing into the attic or bringing their decorations up from the basement.

Here's a unique use of Bromeliads to add colour and interest to a Christmas tree. Now this may not be for everyone but don't forget Bromeliads during the holidays. They provide long term colour and make for long lasting gifts. Yes they are colourful but these houseplants and landscape plants can help you make this holiday season a "green" one! Plus they use no electricity!

Help Needed:

The editor would like someone to volunteer to provide the contents for the "Calendar of Events". As you can see the list is a bit short of information.

It's a job that wouldn't take much time or effort. The result is a very useful resource for members. Wouldn't it be nice to have the next six months available!

Calendar of Events

December 6th - Society Christmas Party at the Uniting Hall, 52 Merthyr Rd., New Farm, Brisbane,

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 8 pm. Classes for beginners commence at 7.30 pm.

Plant of the Month Programme for 2007

JANUARY:	Aechmea, Alcantarea, Ananas, Androlepis, Areococcus, Ayensua.
FEBRUARY:	Billbergia, Brewcaria, Brocchinia, Bromelia.
MARCH:	Canistropsis, Canistrum, Catopsis, Deinacanthon, Deuterocohnia, Disteganthus, Dyckia.
APRIL:	Edmundoa, Encholirium, Fascicularia, Fernseea, Fosterella, Glomero pitcairnia, Greigia, Guzmania.
MAY:	Hechtia, Hohenbergia, Hohenbergiopsis, Lindmania, Lymania, Mezobromelia.
JUNE:	Navia, Neoregelia.
JULY:	Nidularium, Ochagavia, Orthophytum.
AUGUST:	Pepinia, Pitcairnia, Portea, Psuedaechmea, Psuedananas, Puya.
SEPTEMBER:	Quesnelia, Racinaea, Ronnbergia, Steyerbromelia.
OCTOBER:	Tillandsia.
NOVEMBER:	Ursulaea, Vriesea, Werauhia, Wittrockia.

Competition Schedule for 2007

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

March: POPULAR VOTE: Any Genus – species or hybrid

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

June: POPULAR VOTE: Any Genus – species or hybrid

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

September: POPULAR VOTE: Any Genus – species or hybrid

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

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.



Bromeliaceae

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Sept/Oct 2007