Bromeliaceae

VOLUME XLIV - No. 5 - **Sept/Oct 2010**

The Bromeliad Society of Queensland Inc.

P. O. Box 565, Fortitude Valley
Queensland, Australia 4006,
Home Page www.bromsqueensland.com

Editors Email Address: editor@bromsqueensland.com

Contents

From the Editor: Well I have finally got it finished and you have finally received yet another copy of Bromeliaceae. I can only apologise for the delay, there have been valid reasons. I intend to try and get the next edition (the Nov-Dec edition) out within the next month and then work on the edition after that and hopfully get that out at the end of March - that's quite a workload for a voluntary position!

Front Cover:	*Guzmania* 'Odette'	photo by Ross Stenhouse
Rear Cover :	*Guzmania* 'Loja'	photo by Ross Stenhouse

Tillandsia 'Silver Candelabra'

by Derek Butcher 9/2010.

This started about 10 years ago when Mick Romanowski talked about this variegated *Tillandsia viridiflora* he had that flowered with a branched inflorescence and not like the single inflorescence of his 'normal' *T. viridiflora.* I assured him not to worry because the description in Smith & Downs said the inflorescence could be either simple or branched.

In 2007 I heard rumblings from Renate Ehlers about this branched plant she had found which seemed to be a species in its own right and she even got the Mexicans to agree that it was the long lost *T. macropetala* and that the name should be resurrected from synonymity under *T. viridiflora*. This had me checking the old records and this is what I came up with:

"*Tillandsia macropetala* Wawra, Wiener III. Gart. 12: 241, Fig. 50. 1887. Type. *Vienna Hortus ex E. Morren s n* (n v). Identified by description and illustration.

Translated by Butcher

A magnificent plant 1½ metres high, formed by a rosette of leaves, around the base of the shaft virtually 1 metre in diameter; its massive, wide pale red sheaths unite in an oval bulb; its lanceolate leaf blades spreading in a dainty bow, as you look downwards; they taper to a fine tip, a lively green, matt, both sides about the same colour and with faint darker stains and markings. The innermost leaves erect, are smaller and narrower, and merge into the scape bracts above.

The Inflorescence is very long and, very poorly branched Panicle; the Panicle scape is strictly erect, as thick as your thumb and covered over with bracts; the lowermost bracts are leaf-like, the upper ones quickly becoming shorter to about 4 cm long and oblong, keeps the colour of the leaves until the top which is brownish on the outside; they nestle narrowly on the scape, however the acuminate tip is spreading giving the stem a quite rough look. The bracts are very dense at the lower half and imbricate, then they move apart more, so that the scape remains uncovered to the node, at the same time they become thinner and lanceolate; the uppermost are appressed to the stem.

The branches, with our plant three at number, are almost at right angles where they branch off, bending soon upward, shorter than the top spike, always simple and with a primary bract similar to the scape bracts but somewhat wider, and solidly appressed to the branch.

The flowers are densely distichously arranged on the branches, but clearly move apart after anthesis. The floral bracts are similar to the scape bracts, only they are rounder and a little bigger than these; the lowermost are sterile. The flowers are sessile, which with the floral bract are joined on a short stalk.

The calyx is a rounded stem and exactly as long as the bract but appears about as long as the exserted stem. Sepals are pale green, only at the outer tip are some brownish and hardly marked.

The pale yellow petals overhang (to my knowledge) those of all other Tillandsias and Vrieseas, they become 12 cm long; the lower ones are smaller, in the calyx half they are very narrow and the edges are imbricate, and form with the sepals a spiralling tube; the upper larger half is similarly wider so that they become fully 2 cm wide below the rounded off tip. The petals are far apart and after anthesis hang laxly downwards; they are delicate and, (in subdued light) many nerved the nerves run

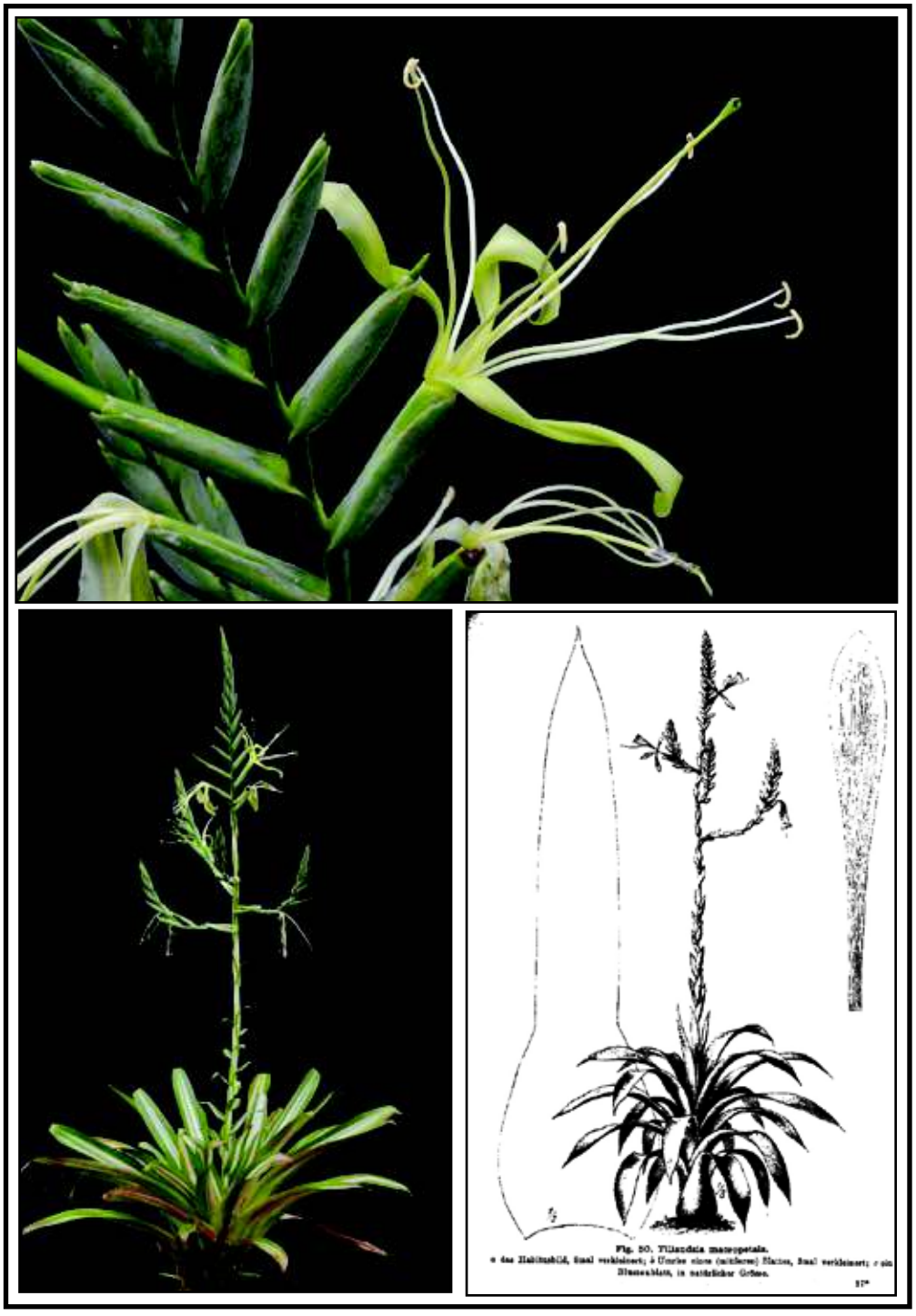

Fig. 80. Tillandsia macropetala.

parallel, bending downwards towards and disappearing near the petal edge, without anastomosis. Nectaries missing at the base.

The filaments straight, prominent, quite free, and about 2 cm longer than the corolla. The anthers are long, very narrow some over 1cm, (pollen gold-yellow), blunt at both ends, attached in its lower third, then split; lying near the fold.

The oblong smooth, with a slimy mass of outer coating Ovary, tapering into the threadlike style above. This is stronger than the filaments, and the tips are bent downwards, blunt triangular and exceeding the filament by about 2 cm, therefore 16 cm long. The leaflike wide stigma lobes are lanceolate, blunt, green and spiral. The linear placenta have many rows, narrow short stemmed, of short stringed seeds.

Habitat: Mexico.

The illustration of this plant (larger in real life), with a leaf and a flower came to me from Liege from my unforgettable friend, the highly regarded botanical and particularly Bromeliaceae expert Professor Morren, a few days after his passing away. Morren seems to have shown great interest in the solution to the problem as to whether this was a new species because of its unique vegetative organs; it was not for him to experience the development of the flower. The expectation of Morren's was amply justified. The plant proved to be a new species, which is mainly based on the very long petals from the other Tillandsias (and Vrieseas). But it shows another peculiarity; our plant has completely the habit of a Vriesea but lacks the honey-scales at the base of the petals. The existence of these scales in Vriesea forms the only decisive, because the flower is different to Tillandsia; for the time being I believe this is a new species and name it *Tillandsia macropetala* because of its very long petals, after deciding to leave the proof as to whether it was a Vriesea or Tillandsia until later. I can only say that so far I cannot decide categorically that honey-scales constitute a Vriesea. Bentham and Hoocker (gene.) admittedly put no big weight on the same and unify both genera under Tillandsia. The entirely different look of that to Vriesea does not appear to justify such an amalgamation in the manner paid to Tillandsia without dividing a natural group. It remains to be seen whether we look for a new difference, whether in the flower or fruit, to take notice of the vegetative organs, incidentally where I had very little material to work with - the examination could be planned only on one single, wilted flower - that maybe tiny scales are the answer."

So we now know what the non-variegated form looks like and this is the one that will eventually bepublished because the writers are only interested in this plant found in the wild. Remember too that when Reed S. Beaman and Walter S. Judd reviewed the species in Brittonia 48(1): 1-19. 1996 no

mention was made of the variegated variety. Taxonomists try to stay clear of variegated plants because they rarely reproduce in the wild from seed. Their reproduction is asexual and there is no one in the wild to move offsets around. Only in cultivation does variegation get selected from offsets, improved on, and circulated.

What about the T. viridiflora var. variegata which was described as:

Tillandsia viridiflora (Beer) Baker, var. variegata W. Seaborn, J Brom Soc 29 : 182 . 1979

A var. viridiflora foliis variegatis differt.

Type: Cultivated W. Seaborn s n (US).

In cultivation this plant picks up a dark red diffusion. The plant was found in the Jalapa, Vera Cruz, Mexico area, 1968.

The photograph clearly shows this is the branched inflorescence form and links to the variegated form that eventually got to Australia. So this plant will be in limboland as to a name because it does not link to T. viridiflora (Beer) Baker in the strict sense.

My interest in this cultivar was triggered by a recent photo of a flowering plant from Peter Tristram from Repton, NSW. I then found out that Mick Romanowski was not the only Victorian growing this plant and had to add Chris Larson to the list. No doubt there are many other Australians growing this plant. I felt it needed a name but it is useless giving a name to a plant for it to be ignored which is why I got growers of this plant involved in the discussion. I asked Margaret for a name – she is good at these sorts of things – and we came up with 'Silver Candelabra'.

Just one word of warning. Even though the plant has been in Australia say over 30 years the adventitious offsets you can expect at the base are many and varied. It is suggested that you only select the variegated ones. If you don't then you will have to call them 'Silver Candelabra Novar' - in other words No variegation!! but if grown on they are just as likely to produce some variegated adventitious offsets!

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

Plant Nutrition. - Calcium and Magnesium, The Neglected Nutrients.

Author: Peter Paroz

Calcium and magnesium are macronutrients essential for plant growth, ranking after phosphorus in the amounts required. Calcium is a component of cell walls and essential for cell permeability. Magnesium is a component of chlorophyll and a co-factor for some enzyme reactions.

Available information, which is scant for ornamental bromeliads, suggests that additional (in relation to that contained in commercial soluble fertilisers) calcium and magnesium would benefit bromeliad plant growth. In this respect, I am guided by the information in Benzing's book 'The Biology of Bromeliads'.

I have been adding supplementary magnesium to Phostrogen for many years with no ill effects. Recently, I started adding calcium as well to a commercial soluble fertiliser as the available information suggested that calcium level from the Brisbane town

water supply was probably too low for the plants needs. Recent observations also suggest that a fertiliser with an NPK of 14:4:24 is too low in potassium. (I believe that leaf tip dieback in the oldest leaves is a reliable indication of insufficient potassium).

Some of the popular soluble fertilisers include magnesium; but I have not found any containing both calcium and magnesium. The reason for this is that it is extremely difficult to devise a mixture of all the essential major plant nutrients that will not 'cakeup' and form an insoluble residue on storage. One solution to this problem is to have the calcium as a separate component which is added when the fertiliser is made up for use. The calcium salt of choice is calcium nitrate; (8 % nitrogen, 23 % calcium) but, for small users, it may not be readily available.

A useful alternative is Calcium acetate which can be easily prepared from garden lime ie. calcium carbonate (NOT slaked lime or quick lime) and vinegar.

You will need a couple of one litre bottles, plastic preferred. Measure out 300 ml of vinegar. Use the cheap colourless variety

All of the photos on this page are of *Aechmea* 'Freca Rosea'

made from acetic acid. Don't waste a good fermented vinegar. Weigh out 15 grams of garden lime and add to the vinegar. Shake well a couple of times and, when the frothing ceases, allow to stand and settle. Don't worry about any insoluble residue. There is an intentional overdose of lime to ensure all the acetic acid is neutralised. Pour off the clear liquid into another 1 litre bottle. Add 100 ml of water to the residue, shake, allow to stand; and add the clear liquid to the first bottle. Dilute the liquid to 1 litre and label Stock Calcium Solution 5g Ca/L.

For convenience, prepare a stock solution of magnesium from Epsom salts. Weigh 50 grams of Epsom salts, dissolve in water, and dilute to one litre. Label this bottle Stock Magnesium Solution 5 g Mg/L.

If you want to experiment along the lines that I have been following, look for a soluble fertiliser listed for fruit and flower. It will have an N:P:K of the order of 16:5:26. Any similar ratio will be OK. Use 0.5 gram /litre of the soluble fertiliser and add 10 ml of the stock calcium and 5 ml of the magnesium solution/ L. Add the stock solutions when the fertiliser is dissolved and nearly up to volume.

Plants are genetically programmed for survival of the species. The sequence of growth is seed > seedling > mature plant > flower > seed development and maturation. With bromeliads, offset production is an additional survival strategy.

The measure of success of a cultural program (light exposure plus nutrition) can be measured by the number of flowers (including branches) developed in the inflorescence; and to a lesser extent the number of offsets produced. In the case of seed raising, the time from setting out the seed to flowering is also a useful indicator. The potential for a particular plant can only be assessed by keeping suitable records.

Tillandsias absorb energy from sunlight via the chlorophyll in the leaves and convert it into sugars. Sugars are 'portable energy'; some of which is used for immediate plant growth and the surplus is stored in the plant stem as starch. This stored energy, along with accumulated nutrients, is used to support the intense burst of growth once flowering has been initiated. This is the reason why I advocate balanced fertilizer applications at regular intervals -weaky and weekly - and growing plants for maximum sunlight exposure; i.e. Maximum intensity that a plant can stand without leaf damage and maximum day length.

This regime ensures that the mineral reserves and stored energy are sufficient to support flower development and seed maturation. This also explains why it is appropriate to remove the flower spike if seeds are not required; in which case the stored nutrients and energy are diverted to offset production.

Final word

Good nutrition and appropriate sun exposure do not make flowers. It allows the plant to achieve its genetic potential.

Aechmea 'Freca Rosea'

By D Butcher Nov 2010.

Who has heard of this name before? Are you interested? If you knew that 'Freca' roughly means 'free love' if you live in the Caribbean Islands would you be more interested?

Well, the story starts in October when Allan Ladd puts a photo on the internet wanting to know its name. There was deafening silence and I said it was a good candidate for the bin even though it had similarities to two photos I had on file namely JG16005 and JG26014 which I had got from John Catlan some 15 years ago. Those were the days when

Top left and below*: Alcantarea imperialis* c.v. 'Whyanbeel' grown and photographed by Richard Harper This plant was until recently called *Alcantarea brasiliana*

Above: *Tilandsia deppeana*

John just had to improve his camera technique what with black cloths, special lighting and stands. And he had a very good camera too. So I used to get sent photos that I tried to identify. These two just did not gel at the time and had been filed under *Aechmea sp*.

A lot of water has flowed under the bridge since then and with the help of international exchange of ideas on the internet our knowledge of bromeliads has increased in leaps and bounds.

In December 2009 I learnt that *Aechmea seidelii* was really a hybrid of sorts and this had me contacting Bruno Rezende Silva, the botanist involved. Although the specimen (dried?) was at Marie Selby Bot Gardens neither Bruno nor Marie Selby could help me out with a photo. Photo's at least give you an idea what the plant looks like. In desperation I contacted Dennis Cathcart and was in luck.

When this query turned up almost a year later I had something to refer to. In the late 1980's Len Colgan in Adelaide had imported 'species' direct from Seidel because he was sure they had to be 'new' to Australia – and they were. The problem was that many did not like living or flowering in Adelaide so several were shipped up north to see if a change of climate would be better for them. Many turned out to not be according to the label. This was exactly the same as I found out in early 1980 when importing species from the USA!!! It transpires that JG26014 could well be the then unknown *Aechmea seidelii*. Investigations seem to suggest that this plant is no longer with us.

So half the problem was solved!

Next was Kerry Tate who had a plant called *Aechmea capitata*, which looked awfully like JG16005. AND up jumped Ross Little telling me not to forget *xNeomea* 'Freca Rosea' which with the photo he sent me also fitted the frame.

The famous Buchanan Ledger had recorded #4098. *Neomea* 'Freca Rosea', US Imp. 88-89, H Quil. Tom Davis Hybrid. No doubt, offsets of this plant would have left Pinegrove Nursery in the intervening years with the inevitable losing of labels! Surely someone in Florida would answer our plea on the internet. Only Harry Luther obliged by confirming that Hazel Quilhot was friendly with Tom Davis who did hybridise (but never registered!!) There the trail ends.

Nobody is going to believe the assertion that we have a *xNeomea* here so we will register it as an *Aechmea* which is a genus that contains lots of odd species. AND after all 'Freca Rosea' has a certain ring to it. It is a smallish plant, approx. 25cm high by 35cm wide when mature.

Alcantareas in Australia

Author Rob Smythe MSc - Nov 2010

The table on the page over, lists the species of Alcantareas known, by me. to exist in Australia (black type). I have not seen all these so some may be incorrect. With the ones in bold text, I have listed species which I have never been notified of as currently being in cultivation in Australia. In addition to this there are many plants already in Australia which have been collected in the wild and have yet to be botanically described as species.

Where has *Alcantarea edmundoi* gone?

According to the recently published Flora of São Paulo (Versieux and Wanderley 2008) *Alcantarea edmundo*i is considered a synonym of *Alcantarea regina*.

Alcantarea regina vs. *Alcantarea imperialis*. (RSS separation guide) Although there are green imperialis and red regina, the first difference that could catch your attention is the colour and shapes of leaves and bracts.

photo Above: Composite photo showing variations in imperialis bracts

Propagating Hair Pups-dry conditions

Propagating Hair Pups-wet conditions.

Alc.extensa growing in its natural habitat in Palo Alto Brazil. photo by Mark Paul

Mark Paul's photo of his Alcantarea garden growing in the Sydney area

These are usually coloured green in *regina* and show wine-red in imperialis. Of course we are talking about nature, there are variants. See species heading below. Leaves of imperialis are usually wider and covered by wax, and have prominent nerves. Narrower green leaved imperialis might present a problem.

The shape of the leaf apex is quite distinct, acute in *regina* and acuminate in *imperialis.*

Because both have upwardly secund flowers (all flowers point upward) *Alcantarea regina* flowers are easily confused with flowers of *Alcantarea imperialis*.

In this article I will be referring to an *Alcantarea regina* known as VdM (photo page 19 - top left). This plant was fairly recently found at an altitude of 2000 metres. The type locality species (photo page 17 - bottom left) is found at sea level near Rio de Janeiro. The latter form is found to approximately 800 metres in São Paulo State. It has been suggested that VdM might relate to *Alcantarea turgida* or *imperialis.* Leonardo Versieux, a leading bromeliad taxonomist has assured me that he is 100% sure it is a form of *Alcantarea regina*. I have studied it and find very little available to dispute his findings. I only say this as with new species, names might rumble around for a while before they

Alcantarea brasiliana	*Alcantarea distractila* *
Alcantarea burle-marxii	*Alcantarea duarteana* *
Alcantarea extensa	*Alcantarea nigripetala* *
Alcantarea farneyi *	*Alcantarea simplicisticha* *
Alcantarea geniculata	***Alcantarea alta*** *
Alcantarea glaziouana	***Alcantarea benzingii****
Alcantarea heloisae	***Alcantarea hatschbachii****
Alcantarea imperialis	***Alcantarea longibracteata*** *
Alcantarea lurida	**Alcantarea tortuosa** *
Alcantarea martinelli *	***Alcantarea turgida****
*Alcantarea mucilaginosa**	***Alcantarea vasconcelosiana****
Alcantarea nahoumii	*Alcantarea.cerosa**
*Alcantarea nevaresii**	
*Alcantarea nova aff. patriae RSS**	
Alcantarea odorata	
Alcantarea patriae *	
Alcantarea regina	
Alcantarea roberto-kautskyi	
Alcantarea trepida *	
Alcantarea vinicolor	
* Not a permitted import at time of writing.	See " imports" below.

settle. It has also been registered as a clone *Alcantarea* 'Visconde de Maua'.

Very annoying to me personally to see species named as clones. Selfings of a species, will still give progeny variation within the circumscription of the species but being a clone its progeny will then be given further clone names. Leaving it with the species name this does not happen. One name there covers all—sorry my wheelbarrow.

This is my attempt to guide you in the separation of *regina* from *imperialis*. I have covered the old and new botanical descriptions minus those which in my opinion are in error (*Wittmack*-genus is wrong and as I read it, it actually covers *Alcantarea extensa* and another reads like *geniculata*) and covered my own measurements on the plant we know as VdM. This is probably a great waste of time as in 99% of cases a look at the photos below will leave little doubt in your mind as to which plant is which. Some green forms of *imperialis* (photo page 17 - bottom) may confuse a little. *Regina* could only be described as petite compared with *imperialis*. They do have a remarkable floral similarity in that both have strongly upwardly secund flowers. The plant depicted in photo page 17 is a monster of a plant growing right through the bush house and looking like *imperialis* but with bracts far more like *regina*.

Leaf blades of imperialis are much wider 12 cm vs. 7 to 10 cm for *regina*. Usually a leathery wide straight to bow shaped large leaves is enough to identify *imperialis* species. There are narrower leaved forms. I don't know if these exist in the wild or if they are possibly distant hybrids with *regina*. In our gardens we find *imperialis* leaves can be 50% wider than for the plants recorded in the botanical literature. I don't know if this is from selective breeding or growing conditions. I don't know what happens with *regina* as all outside of genuine ex *edmundoi* and VdM that I have had sent to me for identification have turned out to be *Alcantarea glaziouana* with its distinctive milk white flowers. Unfortunately this latter plant was widely grown as *Vriesea regina alba*.

Imperialis petals obtuse regina acute (Some of the strongly spiraled forms of imperialis seen by me appear ,in their photos, to have rather acute petals suggesting to me some past history with another species, most likely regina).

Imperialis petals that I have seen are not generally strongly spiraled. When reaching anthesis they quickly go flaccid whether strongly spiralled or not. The less spiralled forms are horticulturally less attractive and flowers can look like a fist of fingers (photo page 17 - top left). *Regina's* petals. I am told, go reflexed and spiraled, in much the same manner and go flaccid just as quickly. Petals in both species change from yellow/cream to white as the day wears on. There is nothing, other than petal tip shape, in the literature to distinguish the flowers of the two species but I have observed that *imperialis* always has red floral bracts and shows some red in the sepals while *regina* can have red floral bracts (usually green) but sepals always remain green. This great similarity is what makes identifying these plants confusing at times. The plant we know as *Alcantarea* 'Grace' (photo page 17) is it *Alcantarea imperialis* aff. *regina* (plant suggests this) or *Alcantarea regina* aff. *imperialis* (bracts suggest this)? Looking at the flowers does not help much at all. I think we would all go for the former as the shear bulk of this plant relates strongly with imperialis. I would also consider selfing this plant to see if it is a hybrid.

[Late note:- Mark Paul has traced this plant's history. It was collected as seed from a plant of *Alcantarea imperialis* collected from the wild in Brazil and grown in a garden in Brazil. There are at least 4 variants

of it in Australia. Some of these are picking up pet names. One is called *Alc*. 'Bill'. The variations probably suggest it is therefore an imperialis hybrid. Mark says the plant (photo on page 17 - bottom right) is more like the unregistered plant 'Bill' than the registered 'Grace'.]

Imperialis can have 15 to 50 flowers per branch while *regina* has a maximum of 25 flowers. *Imperialis* has a much longer inflorescence. Plant in flower is 3 to 5 metres vs. *regina* 1.7 to 2.8 metres. A tall inland form of *regina* has been discovered. These plants may exceed the 2.8 metres limit suggested. Time will tell.

Other distinguishing features without detail e.g. number of sterile bracts per branch, texture of leaves and twisting of leaf tips.

There are some so called smaller imperialis plants around. You might notice they have a glossy rather than a wax covered upper surface. These have been created by crossing, some where (Hawaii?) in recent history, with *Alcantarea vinicolor* and hence are not true species.

Why are the names of Alcantareas in Australia in such a mess?

I would say for nine reasons:

1) They arrived in Australia when taxonomy and collecting data was in a mess.

2) They arrived in Australia before being found and named from wild stock.

3) Visiting authorities named our plants for us on the assumption that they were currently named plants.

4) *Alcantarea extensa* is still a bit of a mess and plants of the then unnamed *Alcantarea patriae* were circulating disguised as *Alcantarea extensa*. A lot of Australian plants causing much of the confusion appear to be these two plants or a concoction of the two (There is a recent paper by Leonardo Versieux in the Brazilian Journal Rodriguésia 61(3) 421-429 (http://rodriguesia.jbrj.gov.br/)

5) Hybridizers were messing without keeping records.

6) Imported seed was either coming in with the wrong name or confused in sowing.

7) Names not challenged, too many growers are happy to have a name—any name will do.

8) More recently, flasked material has arrived with some names being incorrect.

9) Any plants with *regina* in the name other than VdM need to be checked as this name, correctly covered almost all common species at various times, in the early days of bromeliad collecting. Its collection and description and drawings seemed to embrace more than one species of plant. It wasn't really resolved till 1997 after Leme (Bromelia 1997 #3 p28. I have not been able to confirm this and I have seen it written as 43 not#3) cleared up the confused connection with the then *Vr. bloki*i. Description of synonyms *Tillandsia regina* and drawing of *Vr. regina* are inadequate and confusing and the follow up botany was, to me, indecipherable.

How I am going about sorting out this mess?

Persons have tried to discourage me. The horse has not bolted. Species numbers are few and manageable. This is probably the last window of possibility before all the new species start flooding into this country.

Alcantarea is represented by about twenty species in Australia. I have been collecting hair pups widely and must have about 70+. All these are coded and details recorded. Thanks to some generous tourist collectors, collecting wild seed and plants a reference collection is building up. I have contact with all the major taxonomists involved, enjoying their respect (so far) and have all the literature. A data bank has been prepared for quick reference and comparisons. Where ever possible, I will grow one plant and dissect it.

Several serious collectors are collaborating with me and many more are testing out plants in different locations. As an example, Ross Little has confirmed that PF975 known as 'Raymond Red Brown' is the same plant as an incorrect ex-*edmundoi* coded JG191094S2. If you have the latter you know to check your plant when it flowers. You don't get out of it that easy. When mine grow up I will check both are not *Alcantarea mucilaginosa* (Until now not considered to be circulating in Australia). I sent photos to the botanist involved and he said it is a possibility. For those who like to jump the starting gun; lots of Alcantareas produce mucilage in wet weather. My temporarily named plant, *Alc nova* produced it in loads. This mucilage production is very characteristic of the *Alc. extensa* complex. *Alcantarea nova* aff. *patriae* is self-wind pollinated. I tested the exudate and it is sweet. Flowers had no odour. I believe mucilage serves two purposes. A barrier to flower entry to crawling insects and a distractant for hovering insects. It is produced away from the sexual organs, covering and dripping from stalagmites of gum along the internodal regions of the branches. This plant also flowers at night which limits pollinators and it supplies no platform for landing moths. It does not have the deep seated nectary tube so popular with the hovering hawkmoths. This plant seems to do every thing to maintain wind pollination. Just tap the plant and you witness a shower of pollen. I wonder if this has anything to do with growing on steep rock faces? I wrote an article on this plant in Bromeliaceae July/ August 2009 but the pictures were not attached to it. The pictures can be seen in Bromeliaceae Jan/ Feb p8 2010.

What is a species?

With *Alcantarea*, species limits should not be considered as static to the degree that growers usually expect because in the distant past a small flux of genes has spread amongst different plants which eventually evolve as species. That is what taxonomist and gardeners must keep in mind. There is genetic variation within the limits of each species. Thelma Barbará et al (Anals of Botany103:65-77.2009) has shown genetic variance for *glaziouana* is 20% and for *regina* is 22% in the wild in addition this group is still studying gene flow today. Most growers accept the variation found with *imperialis* but hesitate with other species. Variation should be expected. If your plant does not look exactly like your neighbour's plant ,with the same name, it does not mean one or both of you are wrong.

Where do they grow in the wild?

They all grow on rocks or in fields of rocks in Brazil. Most of the horticulturally interesting ones grow on sheer cliffs, clefts or shelves on great granite monoliths known as inselbergs. They all grow in the tropics and

photos Above: ***Alcantarea imperialis***

Green narrow leaved *Alcantarea imperialis* or its hybrid-- A giant growing through the roof of the bush house in Bundaberg—photo by John Gamlin.

mostly at altitude on these granite rocks protruding above the Coastal Atlantic Rainforest. In recent times, more are being found away from the coast. The most tropical is Alcantarea nahoumii from Bahia State and the most southern is regina from São Paulo. The most western inland species are *Alcantarea hatschbachii*, *Alcantarea duarteana* and *Alcantarea turgida* from rocky fields in the highlands of Espinhaço mountain range of Minas Gerais State. Some grow at sea level like *glaziouana* and *regina* while others grow at high altitude like *imperialis*, *geniculata* and VdM.

How to grow alcantareas.

I was only given three pieces of advice when I started growing these about 7 years ago.

1) Fertilize a lot at a tenth of the manufacturers recommended strength.

2) Have good Drainage

3) Use large pots.

Very good advice and about all you need to know, but you know me by now- there is more.

4) Keep the pot bases out of direct sunlight or roots will stew. Alternatively double pot with pieces of foam plastic between the pots.

5) Prevent attack from curl grubs.

6) Don't let air stagnate around the plants.

7) Flush the pots out monthly to remove acids.

8) Water well.

9) Most important. Only roots to be potted below ground level.

10) A support is usually needed when recently repotted.

Fertilizing

These can be very fast growing plants. You don't need to replicate nature. There are no precipitous granite mountains over 1000 meters high anywhere near the sea shore near Bowen and no rainforest to keep the humidity up. I learnt a long time ago that orchids that occur where Townsville now stands grow better from Bundaberg to Brisbane than they do in Townsville. Townsville is perfect for pollinator, germination conditions and host containing germination specific fungi but, past this, they grow better elsewhere. Plants seem to condition to new environments as well. Maybe they won't flower because it is not cold enough but they grow quite well at sea level in the tropics.

Alcantareas seem to do well from Melbourne to Cairns and probably further north. They must be kept moving along. If they stop growing they can stagnate. Keep the fertilizer up to them and keep it dilute. *Alcantarea imperialis* has been reported as flowering after 40 years in the wild. I have heard of hair pups/seed flowering in three years in Australia. Fertilizer has to be removed in some cases to establish size and prevent flowering.

Silicon: the mystery element

Silicon is not known as an essential element for plants but where would the Queensland Gympie Stinging Tree (*Dendrocnide moroides*) be without its silica hypodermic barbs? Recently the Botanists Leonardo Versieux et al. (Nordic Journal of Botany 28: 385_397, 2010) discovered that Alcantareas had round deposits of silica in their leaf cells. He says that all plants belonging to the Poales order (grasses, sedges…). have silica in their epidermis. It may be useful to protect from herbivores and has several other roles (see reference above). Botanists have suggested that as Alcantareas grow on hot rocks this deposit could be a mechanism for reflecting heat away. I believe none of this was the intent of the plant.

I will be interested to see what my silicon starved Alcantareas do growing on my trees. I think the vacuole is just a garbage dump for unwanted silica. My reason is; silica

Photo above**:** ***Alcantarea regina*** **(VdM)**
This has a great future - photo published with permission from Mark Paul

Photo top above ***Alcantarea patriae***
Photo bottom above ***: Alcantarea patriae inflorscence***

Alcantarea geniculata

(sand) as we all know is extremely difficult to dissolve. Roots attack the rock by releasing acid at the root tips. This must become very concentrated on the exposed rocks if it is to take on the rocks. In taking up trace elements, soluble silica (in an acidic form) could be taken up by the plant. Hitting near neutral pH inside the plant, silica will reform as colloidal silica which would be dumped into vacuoles in the leaf. Silica eventually returns to the soil as the leaf dies and drops off. Well that is how a chemist would see it. Charles Darwin may have seen it quite differently.

Diseases of Alcantareas

Your first plant will die from rot starting as a hole where the leaves meet the trunk. If you have followed the rules above and avoided root rot this problem would have been caused by either the removal of a hair pup and not cleaning the wound, or potting too deeply so that the yummy green stuff is presented to a wandering curl grub (have you ever seen a lawn grub above ground level?—no). The grub then eats into the plant and destroys its core. The plant looks perfectly healthy, you hose it and it falls off its perch.

Growing from seed:

Research has been done by Gustavo Martinelli (Reproductive Biology of Bromeliaceae in the Atlantic rainforest of southern Brazil, PhD thesis, University of Saint Andrews Scotland). He found that selfing *Alcantarea imperialis* with its pollen from its own plant results in a greatly reduced number of seeds (0 to 29% success). You need to collect the pollen from a second plant to get good results (52 to 75%). Thelma Barbará, a Population Geneticist is studying (with others) the outcome of selfings of plants with leaves of the same colour. No results published yet. I am guessing a bit but with what I have seen I do think the red leaf in imperialis is a recessive gene so you probably get near enough to 100% red if you self or cross reds. Crossing green with green it is still possible to get some reds. That is simple genetics and it is probably more complex than that for two reasons.

1)There are degrees of redness as shown in composite photo on page 12,with many possibilities like both sides, undersides, tips etc displaying colour, suggesting multi gene involvement.

2) Selfing is not properly carried out by growers. Flower should be covered by a stocking or the like.

Note: (photo 12 - top) Composite photo showing variations in *imperialis* bracts -- supplied by Leo Versieux.

Once you have the seed, growing is simple. If it is raining when pods burst (often the case) dry seed quickly before storing or it will start to germinate and die. I germinate seed in a 'take away' sandwich container rather than a 'hot food take away' container as the sandwich one has a roof sloping down into the media so you can water them without taking the lid off. Sterile coconut fibre is used as a medium. I sterilize it enough by using boiling water or the microwave. If you value your microwave make sure the fibre is very wet. Seeds are soaked for about 2 hours. The usually alive and fertile seeds are removed from the bottom of the jar and spread over the moist fibre. Two hours is rather arbitrary as after 24 hours everything is at the bottom. You can plant the floaters separately but it is usually chaff and dead seeds.

Chaff is unwanted as it just supplies food for possible fungal infection. If you don't get an algal or fungal infection your seeds bulge green, you fertilize them and away they grow. Early in seed development I use a large tray and soak plants from the bottom up. This makes sure all fungi, algae or excess tannin can be dealt with and guarantees that no seed is dry. Divide as soon as you

photo above: ***Alc. nahoumii***
photo left: ***Alc regina*** (see text for details)

Alc. imperialis

can to promote fast growth. They are hungry plants and unlike most plants stay dormant if too closely packed. Growth is slow at the start so I like to cover the surface with seed to produce a lot of green to starve the surface of light. This minimizes algal growth. Spread them out as soon as reasonable. While they are young plants, I often dust the surface with fine coconut peat to minimize algal growth. Algal growth is the curse. It does not kill the plants but when you have too much it dies and releases toxins. Even toxic to us. Beaches are closed when it blooms and horses have died running on beaches covered with decaying algae. This is why I am not suggesting treatment with alginox. With old seed after removing the chaff I often soak them for a further 22 hrs and get greatly improved results. With very old seed sometimes there is not enough reserves. The seed swells, goes yellow-green then dies. It does not make it to green. I am testing out soaking in a dilute sugar solution. Recent tests were upended by a possum. I will report on this later as that was the last of my seed.

Alcantarea imperialis in the wild.

Thelma Barbará et al Anals of Botany103:65-77.2009 did genetic studies on samples of *Alcantarea imperialis* plants collected from inselbergs Irma Menor and Juiz de Fora/Macae-de-Cima pair along with 6 other grouped locations. The latter 6 all cluster well together in the statistical analysis. The Irma Menor data is complicated by a serious involvement of *geniculata* in *imperialis'* past. With the Juiz de Fora pair, the population is slightly statistically removed from the others suggesting, to me, that it may be a different form. The last is at Vale das Videiras. It is unique and I think that may be worth further taxonomic revision as it clusters statistically away from *imperialis* and between *geniculata* and *regina*. In the past, taxonomists looked at morphological features. Geneticists find inconsistencies in small samples of the plant's genome which may or may not reflect collateral change in morphology. A classical comparison in the Animal Kingdom of these two methods of classification would be the following. The DNA of a chimpanzee is closer to a human than to a gorilla. If you were a DNA taxonomist (and a lumper type) you would put chimpanzee in with humans but if you see the animals morphological features chimpanzee would be placed with the gorilla. We fix a problem only to create a new one sometimes. This is only my interpretation from a gardener first, scientist second, point of view of these difficult to understand genetic publications.

Membership Renewal

It's time to renew your membership of the Bromeliad Society of Queensland

Cost:

Single: $35
Family: $40

You can either pay your membership at the meetings or post it in to:
The Membership Secretary
P.O. Box 575 Fortitude Valley

* Membership becomes due 1st January each year

If you are a serious student I suggest you read the works yourself. Statistics is all in the interpretation. I can illustrate this from a quote from my second year Statistical Mathematics teacher. " More people die of heart attacks on the Concord flight than on any other plane"—this means the concord is either the biggest health risk in flying or alternatively their passengers are usually wealthy and could therefore eat too much of the wrong food. A case of age here, called acquired memory. I'm sure the Concord did not exist when I was a student. I think my lecturer said, "Transatlantic Flights". Why destroy a good story with facts?

Growing from hair/grass pups

First problem is getting hair pups. Thelma Barbará et al Anals of Botany103:65-77.2009 has shown that in the wild low altitude Alcantareas propagate mainly from vegetative reproduction where as high altitude ones reproduce by sexual (seed) propagation. In agreement with this, low altitude plants grown in the garden, tend to hair pup frequently, whereas high altitude plants do just the opposite. This may be just environment. Hair pups can wither and die during windy weather. In the cold (at altitude) the same may happen. They can be very thin with high surface to mass ratio. They could be vulnerable to environmental issues. Does this reflect into garden grown specimens? The answer is in part –yes. *Alcantarea imperialis* is occasionally monocarpic i.e. only grows from seed. *Geniculata* is high altitude and yet some of these oppose the theory as they can be prolific "puppers". Looks that way for some in my garden but my plants are very small and of doubtful origin. I do think that I have read that *geniculata* comes down to fairly low altitudes in places in the wild and these plants may be the pupping forms. Earlier I said 'in part correct' as I find I can induce just about all young plants to hair pup

by wounding the base. Pulling leaves off a bit green could kill your plant if it was subsequently infected. Alternatively it could induce scar tissue formation which can progress to adventitious growths. In the wild I believe a lot of adventitious growths are smothered by a skirt of dead leaves so in the garden we need to remove this skirt otherwise pups will stay white and die.

Removal of hair pups.

Early rather than later, that is my rule. They can be difficult to remove when they have size. Removal can squash and or damage them or their host plant. I like to see them chubby with a root. I regularly remove these under 5 cm high. Almost never lose any. I sit them in a community pot containing fine coconut fibre. You want only the roots underground. They are too small to stake. Instead, what I use is drinking straws (photo page 12). I cut the straws lengthwise so that the plant can expand inside them, then I push the straws, enclosing the base of the plant, into media till the plant just touches the surface. You can get various width straws. Larger ones are used by kids drinking the various slushes so popular today. Even bigger ones from florists. Recently, with wet weather approaching, instead of straws, I have used that flat plastic coated garden wire (photo page 12), made a little loop with a long leg . Pushed leg into pot then sat the plant in the loop. Plant just sits upright on top of the media. Untested yet but probably straws should be the best for dry conditions and loops for wet.

Note: re Imports http://www.aqis.gov.au/icon32/asp/ex_querycontent.asp

See table at the top of this document and details at URL above.

There are quite a few flasks around and it becomes very confusing when suppliers are spreading around the wrong plant in large numbers. If you have bought flasked plants of *Alc. nahoumii* you should put a question mark on them. We may have to wait till they flower to identify them. What I have seen are not really at all like nahoumii and would appear to be from the *extensa/ patriae* complexes. Most likely *extensa*. In addition to these, I was concerned when I saw flasked plants of *geniculata* with all their leaves yellowish. I have been told these are probably OK as there was a yellow variegate form in NZ and variegates lose markings on flasking. This would explain the sallow colour.

Imported Seed.

Problem again, imported *geniculata* seed is in some cases correct and other times wrong. Many other examples can be found. *Alcantarea roberto-kautskyi* turning out to be *imperialis* etc. Just adds further to the naming confusion.

My favourites as garden subjects

Alcantarea imperialis I feel is almost everyone's first favourite. If we had it in Australia, I would put the red form of *Alcantarea turgida* before it. Seems that the red leaves are the big attraction. A picture of *turgida* can be found at (R. Smythe "*Alcantarea Turgida*" Bromeliaceae Jan/Feb. pp15-16 2010). Unfortunately the red leaves on some plants can be a put off factor for me. These poor forms are just far too common (photo page 17 - top left). Search around for a good form. My favourites are the green leaved forms. All the wide leaved plants are stunning. Very leathery and often very straight leaved. I have seen a beautiful green form with rounded leaf tips coming from NZ and another green form with more pointed tips (curled sides at tip) circulating sparsely in Australia (photo opposite bottom). The narrow leaved forms, if they are pure imperialis, don't grab me as much. Some of these are extremely tall suggesting hybrid vigour. The bract shape and inflorescence suggest to me that *Alcantarea regina* may be involved (photo page 17 - bottom right). The tall column of flower spikes

Alcantarea imperialis **(cabbage form)**

Alcantarea glaziouana **(Large growing form).**

Alcantarea imperialis **(Large growing form)**

can be impressive especially if the bracts are bright red. Unfortunately the flowers for many imperialis plants are usually a flop. Barely mature when they actually do flop (or go flaccid in jargon terms see photo page. 17 - top left)

***Alcantarea imperialis* (cabbage form)**

(photo page 25) I believe this one comes from Nova Friburgo which would put it in the grouping of two statistically removed from the main bunch of *imperialis.*

***Alcantarea imperialis* (large green form)**

(photo page 25) This is my favourite- It has form and elegance. I would like to know where it comes from. Molly says, " It makes a great Puppy Gazebo".

***Alcantarea glaziouana* (Large growing form).**

(photo page. 25) Flat puffy milk white flowers is a dead give away for this species. Genetically it is a well defined species but can vary in height and can have pink bracts. There appears to be quite a variation in leaf width as well.

Plant commonly incorrectly named in Brazil

This photo (page 21) taken in Brazil, where I was told that this concolour green form of *imperialis* growing amongst the red and bicoloured leaved forms were (at least in 2002) erroneously known as *regina* (as per photo). I believe this plant would now still be classified as an *imperialis* as the inflorescence mostly looks correct. This plant lies within the *Alcantarea imperialis* variation. Leaf shape and lower scape bracts are a worry. It probably comes from the intergrade with *geniculata* site mentioned earlier. It is not a primary hybrid as branches are too long. If what I say is correct and this may come from Vale das Videiras. one should ask,"Is this a new species"? No not for me. Thanks to Derek Butcher for getting permission to use this photo.

Alcantarea imperialis

(photo page. 21) One of the more attractive bicoloured forms. Mine does not look like pupping. Some of this type are known to be monocarpic which means I may have to grow my next one from seed.

***Alcantarea nahoumii* (most tropical Alcantarea)**

(photo page 21) The northern limit of distribution of Alcantareas in Brazil is set by *Alcantarea nahoumii*. This particular clone I have traced back to Chester Skotak in Costa Rica. Most of the plants sold with this name I believe are from flasks. These show wax banding and are purple blotched plants so they are not *nahoumii.* When they flower I should be able to help. The above photograph I took in John Catlan's bush house.

Alcantarea patriae

I believe there is a lot of *Alcantarea patriae* (photo page 19) and its hybrids in Australia. Must have come in a long time ago. I am watching at least three different strands of plants found here and traceable to older collectors that could be *patriae*.

***Alcantarea regina* (VdM)**

See photo (page. 19)

Alcantarea geniculata

The photo of this plant (page 19) published with permission from Mark Paul. The plants shown in it are hail damaged but otherwise as good as you can get are the bigger ones at the back. Must be lots of hybrids around as it is difficult to even find a picture that matches the plants botanical description.

Alcantarea imperialis

The photos illustrate a number of different forms The photo (page 17 - top left) is of a red form with poor markings and the more usual scatty flower.

In stark contrast to the previous photo, a well grown good form of the same species (photo page. 17 - top right) as previous photo,

grown and photographed in Queensland by John Crawford. Interestingly I checked the viability of the seed from this plant and it was 23% suggesting it was self pollinated by its own pollen c.f. "Growing from Seed" section above.

Alcantarea regina

The plant shown in (photo page 17) is something that I have been searching for, for years. The type form of *Alcantarea regina*. I still have not located this plant in the Australian collections that I have visited. photo supplied by Leo Versieux.

Acknowledgement

This article has grown from a scatty diatribe to a near scientific paper thanks to the relaying by Mark Paul of his experience while tramping through their habitat. Special appreciation to Leo Versieux for advising me on my technical difficulties and supplying me with correct spelling for about every locality in Brazil that I tried to spell. I still don't know how to generate all those squiggles and things found with Portuguese writing. Hope I have not offended any one by leaving them off. I hope they are more involved with pronunciation and not with meaning.

photographs

Taken by me unless individually acknowledged. - Rob Smythe MSc

Bromeliad Society of Queensland

Annual General Meeting
Date:
Thursday 17th February 2011

Venue:
The Uniting Hall,
52 Merthyr Rd.,
New Farm, Brisbane.
commencing 7.30 pm.

Calendar of Events

Sat/Sun 2/3 April - Bromeliad Bonanza - Plant Show and Plant Sale - Opening Times: Saturday 2nd 8.00 am - 4.00 pm - Sunday 3rd 9.00 am - 3.00 pm

Spectular displays of Bromeliads, Over 700 varieties/hybrids of Bromeliads on sale, advice on cultivation from experienced growers, displays and most of plant sales areas under cover, refreshments available for purchase, Monster Bromeliad raffle, wide range of bromeliad books on sale including Starting with Bromeliads a comprehensive bromeliad guide for sub-tropical and tropical Australia, plenty of free parking - ADULTS $3.00 - Children under 14 free. Public transport: BCC bus 471 from City or Great Circle Bus 598 from various suburbs.

Do you receive the BSQ email newsletter (titled 'Bromeliad Newsletter')
If you would like to then send an email to :
Secretary@bromsqueensland.com
Include your name and email address

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