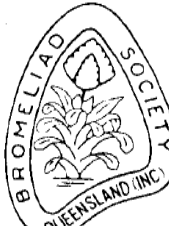


# *Bromeliaceae*





# The Bromeliad Society of Queensland Inc.

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Front Cover: *Guz. 'Graaf van Hoorn'*

photo by Ross Stenhouse

Rear Cover : *Guz. 'Patricia'*

photo by Ross Stenhouse

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# Travels in Southern Peru

Author: Bruce Dunstan

In 2008, prior to the Heliconia Society International Conference in Iquitos, I set off on an adventure with three good friends, Jan Hintze from Darwin and Carla Black and Angel Rodriguez from Panama. The locality we were keen to explore was the mountainous slope of the Andes in Southern Peru, between Cusco up high in the sacred valley down to the world famous Manu National Park, Peru's largest, at around 800m elevation.

I had travelled to this area in 1996 but had only been at the top at Cusco and flown through the peaks of the Andes to land down at an old disused Coca airstrip at the bottom along the banks of the Madre de Dios river. It was here in Manu National Park we were to see amazing animals like jaguar, giant otters, tapir, black and white caiman, sloths and spider, howler and capuchin monkeys. The flora down in the basin was typically Amazonian with low levels of diversity and similar species to other localities within the huge Amazon River basin.

It was the slope and changing elevation I was keen to explore. This region of southern Peru, while tropical, is occasionally subject to cold blasts of air as large cold fronts come up from Chile and Argentina to the south. Temperatures down to 7°C are common and while we were at Manu in '96 we travelled by boat one morning in 13°C that felt absolutely freezing with the wind chill of the moving boat. The fact we were four hours up the Rio Manu in virgin Amazonian rainforest felt all the more strange considering how cold it was. The Amazon is meant to be a steaming torrid jungle, not chilly!

For this trip we were driving from

Cusco in a rented 4WD with a driver, down the steep slopes to the jungle town of Pillcopata, in a day's drive.

Jan and I flew into Cusco after the long flight from Australia and the next morning met up with Carla and Angel. The 3000m that Cusco sits at caused a few issues with limited oxygen in the thin air and any moderate activity, like walking around, can quickly result in shortness of breath. We bought some last minute supplies changed a few dollars with some roadside moneychangers, filled up with diesel and then set off. From Cusco we drove through good roads to the town of Pisac through the previously mentioned Inca Sacred Valley. Ancient Inca ruins lined the road and hillsides. Agricultural terraces made of stone were amazing in the way these ancient people had changed the shape of the steep slopes so they could grow their crops of potato, beans and amaranth with irrigation from the natural springs that pop out of the massive mountains that are the Andes.

The first Bromeliads seen in this region of high elevations were Puya, not a genus I have had any interest in, but there were two species growing along the roadsides. Tillandsias were also spotted as we tried to get as many kilometres as possible towards our night time goal of getting down the hill to Pillcopata. First we had to climb up out of the valley and make our way between the mountains through the pass at 4200m elevation. There was snow on the ground and walking around at this elevation to take a call of nature was really tough going. The sight of small Quechua children tending animals at this location was amazing. What a tough existence.

Once we were through the pass we quickly began descending into the Amazon basin. The road is an amazing sight and I had looked it up on Google Earth prior to the trip to see what we were in for. It has switchback



Carla Black with *Tillandsia cf. stenoura*



Bridge to nowhere

after switchback as the road loses altitude. We saw the same Puyas again as we lost the altitude we had gained at the pass. Growing at the high elevations were many *Tillandsia walteri*, a spectacular tank type with a bright pink paddle-like inflorescence. These plants grow on the large rocks along the side of the road. A large blue grey striped *Agave* sp. is also common at this elevation. We stopped at the town of Paurcotambo for a quick cup of coffee for some, while Carla and I tried the coca tea. In Cusco this is served as tea bags while in the roadside restaurant at Paurcotambo we had just shredded loose leaves. Unsure of how much we should use we opted on the heavier strength just in case we could get a better result in coping with the elevation and lack of oxygen we were experiencing. Feeling much refreshed we set off further along the road.

Travelling among the dry stony fields that served as people farms, we were constantly heading down hill, losing altitude and as we did we began to see more small stunted trees and the sky began to get cloudier. We were entering the elfin cloud forest that lines the upper elevations of the Amazon basin. This forest is constantly wet and cloudy as winds blow the hot humid air from the lowlands east and when it hits the Andes Mountain range it is forced up by the mountains where it drops its moisture. It is always wet and windy.

As we were descending we started to notice bright flowers in and amongst the trees. *Oreocallis*, a shrubby tree with pink flowers, is related to the bright red Tree Waratah that grows in Nth Qld rainforests. Also common were bright red tubular flowers of Ericaceae related to blueberries and Azaleas. The plants have developed bright tubular flowers to attract hummingbirds to pollinate them. Also growing in this cool windswept forest were some spectacular *Tillandsias*. Tank types

in flower were *T. buseri*, with a bright red inflorescence nearly a metre tall with white flowers, also growing side by side was *Tillandsia rubella*, its inflorescence was just as spectacular, bright pinkie purple with blue flowers arching out and hanging over to 500mm long.

Also growing at this high elevation stop were pink flowered *Melastomes*, related to *Tibouchinas* that are commonly grown in Australian gardens, as well as a very attractive upright sagitate *Anthurium* with heavily textured leaves. Plants from this elevation would be very difficult to cultivate as they have very little range in temperature where they naturally grow. It is the elevation that moderates the temperatures, probably never below 16°C and never above 24°C. If they were grown without climate controlled conditions they would be unhappy if it ever got cold or hot.

We also drove past tall flowering *Guzmania gloriosa* with yellow and red inflores-



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cences held up above their dark green leaves, growing on the impossibly steep slopes. We then came across an amazing sight to see what appeared to be a bridge appear out of the clouds from nowhere. We stopped again and took photos and back into the 4WD it was quickly solved as we headed into a tunnel bored straight into the rock of the mountain. The entrance was dripping in moisture from the mountain and covered in Pitcairnia plants like a green carpet. Slowly we crept along in the dripping dark when suddenly we appeared out the other side of the tunnel and out on to the bridge high above the forest below.

I should mention at this time the road down to Pillcopata is very narrow and unpaved. Trucks and buses come up one day and down the next, as it is very narrow. We were in a 4WD so were able to do what we wanted although at every blind corner our driver was on the horn to let any other drivers know we were coming. Plants that are at eye level are actually up trees 10-20m tall and the slopes above the road were way too steep to attempt to go more than 2m up as losing traction or your footing would result in a quick slide and ending up in a heap on the road or even worse going over the other side and getting to the bottom of the valley the quick way. A number of times we tossed rocks over the edge and most times we could never hear them hit anything below.

The road is also unerringly the same gradient as it snakes along and around any terrain changes. From a distance it looks like a snake working its way down the valley along a very regular angle of descent. We noticed a second road is being built below the original so traffic won't be so constrained by 24-hour periods.

After running into the odd truck, which meant stopping and reversing back to find somewhere we could pull off the road and let the truck pass, allowed me to get out and

start looking at plants. At the higher elevations the trees were loaded in bright red-foliaged Tillandsias probably an adaptation to the high UV levels the plants experience at that elevation. We saw plenty of *Tillandsia truncata*, a large tank Till with a metre long tripinnate pink inflorescence that arched out sideways.

*Tillandsia confinis*, another 'tank' only half the size with a bright orange, branched inflorescence as well as *Tillandsia laminata* with a bright pink upright tripinnate spike, were seen. Also growing at this altitude was *Guzmania morreniana* with its tall thin spikes topped with a maroon club like inflorescence. The highlight in this elevation for me was seeing *Guzmania vinacea* in flower. This plant will one day be a fantastic flowering houseplant, mass-produced in nurseries. I've seen images of it being multiplied in one European nursery. The foliage is a dark green with wine red undersides. The cylindrical inflorescence is also a wine red colour with creamy yellow flowers.

As we headed down the hill and lost more altitude we saw more and more species. Large flowering examples of *Guzmania squarrosa* with bright red and yellow bracts were growing in the same trees as *Mezobromelia pleiosticha*. These plants had 1m long red spikes. Also at this stop were *Werauhia ringens* and another large *Tillandsia* sp with a tall 1.5m branched spike that may have some affinity to *T. stenoura* although it was much thinner and sparser to others I have seen.

While all this Bromeliad action was unfolding we were also seeing many *Heliconia* species, *Fuchsias*, *Orchids*, *Aroids*, *Bomareas* and notably different coloured *Calceolarias*. As I get older my tunnel vision of plants is diminishing. I kid myself that I'm becoming a generalist, but occasionally the tunnel vision returns, usually when I see a *Heliconia* species new to me in the wild.

The rich diversity was intoxicating - the change in elevation allows speciation to occur over time. The sheer number of species growing so close to each other in such a short distance is incredible. This diversity is something you don't see when you get to the bottom of the hill in the Amazon basin.

To make a long day shorter we eventually ran out of light and had to continue down the road using our headlights which seemed safer as trucks could see us coming except on the blind corners. We eventually made town and quickly found a great family run establishment that provided rooms, breakfast, dinner and as much beer as we could drink for \$20 a night. We could also access wireless internet from across the street for free or walk across and pay 1 Sole, \$0.50 to use their computers. This was Pillcopata, a logging frontier town that is becoming an eco tourism hub for the Manu National Park that is nearby.

We spent another couple of days looking for plants in the surrounding forests, which were being preserved for tourism. The area is rich and we found some beautiful Heliconia species. One notable plant was

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*Tillandsia truncata*



*Tillandsia laminata*



*Mezobromelia pleiosticha*



*Heliconia robusta*, discovered in 1909 and to our knowledge was not being cultivated anywhere in the world - needless to say it is now in one of the Heliconia Society International Conservation Centres.

Seeing Bromeliads in the forests around Pillcopata was very tough, as most plants would be growing up in the tall canopy. The only way you see them closely is when they fall to earth after storms or when the whole tree falls. Away from the light they die quickly on the forest floor or are eaten by the wildlife.

We headed back up the 'hill' to Cusco and continued on to Machu Pichu, as most tourists do when visiting Peru, most satisfied with what we had seen on the Paurcotambo to Pillcopata road. We then flew up to Iquitos for our conference and post conference trip up the Rio Napo by boat. Another story in the making.

I would like to thank my travelling companions Carla, Angel and Jan for allowing me to jump out at the strangest times to look at plants they had no or only a passing interest in. I would also like to thank Dr Harry Luther for giving his opinion of what my average photographic skills captured in my images ( on pages 6,8,10).

*Images illustrating this article by the author with the exception of the image of Tillandsia laminata. which is by Carla Black. Ed*

## **Bromeliad Ant Plants**

Author: Peter Paroz

*Tillandsia bulbosa*, *T. caput-medusae*, *T. buyzii* and a few related atmospheric are bulbous in shape with an attractively swollen onion-like base from which a dozen or more twisted leaf blades protrude.

Rather than trapping rain water and debris, these small dark lens shaped chambers at the base of the shoot house ants and other anthropods.

Occupants of these cavities enter and exit through holes chewed in the bulb, or if small enough crawl up and down the narrow groove produced by the up-rolled leaf blade.

Because of this frequent association with ants, these species should be considered myrmecophytes -literally ant plants.

These pseudo-bulb producing tillandsias with their inflated leaf bases, constricted at the top, form cavities with little access from the exterior. Most grow ageotropically (no orientation due to gravity), frequently from vertical surfaces or undersides of tree trunks and limbs. Since the swollen basal part of the shoot is mostly dry, empty space, its potential for water storage is negligible.

Although prevented by structure and orientation from impounding plant litter and moisture, the leaf base enclosures are accessible by holes chewed by animals and are routinely inhabited by ant colonies. There are advantages to be gained by harboring ants; and these probably provided the impetus for the evolution of the bulbous form.

Ants can service a bromeliad in two ways: by protecting it against plant eating predators and providing nutritional supplements. Many species of ant capture prey on or beyond the host and bring it into the nest.

Once in the leaf chambers, captured bounty or any ant excrement containing

## **The BSQ Web Site**

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The URL is:

**[www.Bromeliadsqueensland.com](http://www.Bromeliadsqueensland.com)**



*Guzmania vinacea*



*Tillandsia buseri*



*Heliconia robusta*



*Tillandsia confinis*

needed minerals will come in contact with the absorbing trichomes that line the interfolia cavities.

Wet pieces of cotton swabbed into the chambers of *T. caput-medusae* in Costa Rica yielded significant amounts of nitrogen.

Radio-active calcium applied to the surfaces lining the bulb cavities of *T. caput-medusae* was rapidly absorbed and translocated throughout the plant body.

*Aechmea brevicollis* and *Ae. mertensii* and some other bromeloids commonly root in arboreal ant nests in habitat from which they undoubtedly acquire significant amounts of moisture and nutrients. In extreme cases, this reliance on ants seems to be obligate and more complex than that described for the pseudo-bulbous tillandsias.

*Ae. mertensii* is difficult to grow in cultivation. A study of the conditions in the ant nest indicate a very acid condition; and this may be the clue to successful cultivation along with avoiding alkaline water.

In my own collection in Brisbane, I have only ever noticed ants consistently colonising plants of *T. streptophylla*, even half developed offsets. These are shiny black ants –to about 7mm- which swarm at the slightest disturbance of the plant; and fortunately do not sting. Occasionally there is evidence of ant activity in *T. caput-medusae* and *T. seleriana*, I have not observed any ant activity in any of the smaller pseudo bulbous tillandsias – *T. bulbosa*, *T. disticha*, *T. butzii*, *T. pseudobaileyii* etc.

### **Technical information from David Benzinger's 'The Biology of Bromeliads.**

Ant plants are correctly known as myrmecophytes; plants adapted for housing ant colonies. *T. caput-medusae* was so named because the leaves are contorted, producing a likeness to the mythical Greek Medusae, the drier the plant the more twisted the leaf blades.

### **Note**

For bromeliads growing in dry open potting mixture or in dry ground, the presence of ants in or around the pot may be an indication of a potential mealy bug infestation. Mealy bugs have been a cause of problems –mealy bug wilt- in pineapples, but I am not aware of any problems in potted ornamental bromeliads. However, with the increasing use of bromeliads as landscape specimens, a regular inspection is a reasonable precaution.

## **Bromeliad Video Production**

Members Ross Stenhouse and Bob Reilly are in the early stages of planning for the making of an instructional video about bromeliads.

We have mentioned previously that a video was to be made and that process recently took a big step forward with Ross acquiring a professional broadcast quality video camera and ancillary equipment. Ross has made a number of videos on aviation which have uploaded onto the internet (youTube).

The target audience for the video are those who are just starting growing bromeliads. The first scenes to be shot will be about offsets and their removal from the mothers.

Once you start to seriously consider producing a high quality video, you soon realise why the credits at the end of a movie are so long.

At this stage Bob and Ross are looking for someone to appear in front of the camera and do voice overs for some of the scenes. Previous experience is not necessary and you will be working from a script written by Bob.

If you are interested, please contact Ross via email and let him know.



Illustrations are of *Alcantarea* 'Bok'



## Alcantarea 'Blok'

by Derek Butcher May 2010.

This cultivar name has been used to replace *Vriesea blokii* treated by Leme as a synonym of *A. imperialis*. The plant with this name in SE Queensland seems to have come from a John Bolger but nobody knows where John Bolger got his plant. But then other anecdotal evidence suggests that John Catlan got his plant in the 1980's from a nursery called 'Forest Glen' on the NSW coast who in turn got it from a 'Colonel'. The Colonel just has to be George Clarke, the inaugural President of the Central Coast Brom Soc and we know he did import.

In 1935 this plant was in 'Das Pflanzenreich' Bromeliaceae by Mez as a *Vriesea* having been previously known as a *Tillandsia* and we know that the description by Mez was based on the painting in Botanical Magazine 1908 plate 8192. In 1966 Lyman Smith in *Phytologia* placed it as a synonym of *Vriesea regina*, accepting Mez's description as being correct and apparently not checking the herbarium specimen at Kew. Leme revealed in *Bromelia* in 1997 that the actual herbarium specimen at Kew told a different story and that *Tillandsia blokii* should have been treated as a synonym of *Alcantarea imperialis*. Whoever did the painting in 1908 took artistic licence in drawing the plant as flowering distichously not secund as it should have been. As the painting shows, this plant could easily have been identified 'correctly' as *Vriesea blokii* before Leme's revelations in 1997.

So we have an errant plant called *blokii* or various spelling of this name for a plant that flowers depauperately.

Mark Paul says it is a depauperate/simple form of an *A. geniculata* type with a simple inflorescence [generally only a couple of branches on the scape but flowers and all other attributes as per *A. geniculata*].

He could well be correct but there is still the odd flowering habit to contend with which is why I propose the cultivar name of 'Blok'. I have tried over the years to get Queenslanders to report on this plant because the only photographic record I have is from John Catlan in 1995. Ross Little of PineGrove has sent me a photo, admittedly well past its use by date but it does show recognisable characters to warrant the continuation of the name, admittedly as 'Blok' but at least it will not be swallowed up under the variable *A. geniculata*.

I am now going to show you what was written about *Tillandsia Blokii* in 1908, over 100 years ago. Clearly they knew the difference between *Alcantarea imperialis* and 'Blokii' and I have a feeling that Elton Leme may be incorrect in treating it as a synonym. The particular herbarium specimen at Kew used by Leme could well have been pressed incorrectly. In any event, here is what was said and I leave you to judge.

The more adventuresome of you may even butcher their plant to see if it agrees with this old description.

TAB. 8192.

TILLANDSIA BLOKII

South America.

Bromeliaceae

TILLANDSIA. Linn.; Benth. et Hook. f. Gen. Plant. vol.iii. p.669; Mez in DC. Monogr. Phaner. Vol. ix. p.633

*Tillandsia Blokii*, Hort., Gard. Chron. 1898, vol. xxiii. p. 254 ; Journ. de la

Soc. d'Hort. de France, 1898, vol. xx. p. 479 (nomen tantum); species ex

affinitate *T. reginae*, auctorum, a qua differt foliis latioribus rubro-maculatis, bracteis sanguineis, floribus minus divergentibus et petalis luteis biligulatis.

Planta perennis, monocarpica, florifera circiter 2 m. alta, caule simplici crasso brevissimo. Folia numerosa, densissime rosulata, crassa, coriacea, lineari-oblonga, usque ad 1 m. longa, infra medium circiter 15 cm. lata, apice abrupte longeque acuminata, integra, inermia, recurva, maculis rubro-purpureis ornata. Inflorescentia terminalis, erecta, pinatim paniculata, circiter 1.5 m. longa; scapus bracteis amplis coriaceis sanguineis ovato-acuminatis diu persistentibus vestitus; rami laterales circiter 14, quaquaversi, curvati, recurvi, 20-30 cm. longi, flexuosi, sanguinei, usque ad 12-flori. Bracteae floriferae ovatae, acutae, quam calyx dimidio breviores, sanguineae, calyci arete appressae, persistentes. Flores distichi, breviter pedicellati, inter se 1.5-2 cm. distantes, circiter 10 cm. longi. Sepala 3, lanceolata, 4-5 cm. longa, acuta, sanguinea, coriacea, persistentia, capsulae longiori arcte appressa. Petala 3, linearia, circiter 10 cm. longa, acuta, intus basi ligulis binis dentatis instructa, cito marcescentia. Stamina 6, petala aequantia. Stylus trifidus, stamina vix excedens. Capsula (plane matura non visa) 3-locularis, oblonga, 5-6 cm. longa, acuminata, subcarnosa, nitida; loculorum parietibus intus atro-purpureis nitidis. Semina numerosissima, cylindrico-clavata, ferruginea, cum cauda terminali demum in pilos dissoluta comiformi circiter 2 cm. longa, basi coma pilorum obversorum ex ovuli integumento dissoluto ornata; rhaps valida, demum libera. - *Vriesia Blokii*, Hort.

The species of *Tillandsia* (or *Vriesia*) of the group to which *T. Blokii* belongs have been much confused, partly in consequence of authors attempting to identify different species with the very rude, diagrammatic figure of *T. regina*, Vell. (Fl. Flum. Ic. vol.

iii. t. 142), partly from the fact that Lemaire figured (Illustr. Hort. vol. xiv. t. 516) one species, the one generally accepted as *T. regina*, and described another, the *Vriesia imperialis*, Morr. ( *V. Glazioveana*, Carr. in Rev. Hort. 1881, p. 50, with a coloured plate), partly also from differences of view as to specific limits.

Mr. J. G. Baker (Handbook of the Bromeliaceae, p. 22) included *V. imperialis*, Morr., and *V. geniculata*, Wawra, under *T. regina* ( *V. Glazioviana*, Lem. in Ill. Hort.. 1867, t. 51 6); but Mez, with complete specimens before him, restored them to specific rank (DC. Monogr. Phaner. vol. ix. p.615, and unravelled their very much involved synonymy. *V. imperialis* differs from the others in having secund, not distichous, white flowers, and in stature, sometimes attaining a height of 16 to 18 ft. *T. regina*, as known to us, has distichous, white bracts and flowers, only the lower bracts being tinged with red; and the flowers are given off at nearly right angles to the axis. But there is a drawing in the Morren collection at Kew of a *Tillandsia* having a red scape, green bracts, red inside, a green calyx and yellow petals, which Morren himself named *Vriesia gigantea*, a garden name for *T. regina*.

The history of *T. Blokii* is obscure and its origin apparently not recorded. A very fine plant of it was exhibited in flower at the Ghent quinquennial meeting in 1898, but the name of the exhibitor is not given in any of the contemporary papers. In the Gardeners' Chronicle report we read: "The giant of the family was a huge specimen of *Tillandsia (Vriesia) regina*, shown as *V. Blokii*. It was as tall as a man and in flower." And practically the same statement appeared in the Journal de la Societe National d'Horticulture de France. Mr. F. W. Moore, to whom we are indebted for the specimen figured and for photographs of the entire plant, writes: "I purchased the plant

in question from l'Horticulture Colonial, Parc Leopold, Brussels, in April, 1903, under the name of *Vriesia Blokii*. It was a healthy little plant, about twelve inches high, and I was given to understand that it was a seedling of the original, shown at Ghent, and quite distinct from *T. regina*. It did not flower with me until last year. The whole plant is about 6ft. high, and the diameter of the inflorescence from tip to tip of the branches is 2 ft. 3 inches. I think it is a finer plant than *T. regina*, and the large bracts retain their colour through the fruiting stage."

The seeds of many of the Bromeliaceae are very singular and beautiful objects. Those of *Tillandsia Blokii* are exactly like those of *Vriesia imperialis*, Morr., as figured by Mez (Fl. Bras. vol. iii. pars 3, t. 105). They are narrow, cylindrical or clavate bodies, tailed at the distal end and furnished with a reversed coma, at the base enveloping the lower half of the seed. When the seed is ripe the tissue of the tail is broken up into hair-like rows of cells similar to the pappus of a composite. The basal coma, in the same manner, is the result of the breaking up of the outer integument or testa of the ovule. The integument breaks up in a variety of ways in different species of the genus.

In *T. Regnellii*, Mez (Fl. Bras. t. 110), for example, it breaks up into a reversed coma at each end, the hairs of which overlap each other and completely clothe the body of the seed. Unfortunately we did not receive the seed of *T. Blokii* until after the plate was printed.

DESC. Shrub, flowering only once, though of several - sometimes twenty years' duration. Stem very short, unbranched. Leaves numerous, densely tufted, thick, leathery, narrow-oblong, 2½-3½ ft long, about 6 in. across in the widest part above the broad base, tapering upwards, abruptly long-pointed. entire, unarmed, recurved,

beset with oblong, purple-red blotches, Inflorescence crimson, terminal, erect, pinnately paniculate, 4 ft. 6 in. to 5 ft. long; scape stout, clothed with broad, sheathing bracts; lateral branches about 14, spreading in all directions, recurved, 8 in. to 1 ft. long, zig-zag, 10-12-flowered. Floral bracts ovate, acute, half as long as the calyx, closely appressed, persistent. Flowers in two rows, very shortly stalked, ½-¾ in. apart, about 4 in. long, Sepals 3, lanceolate, 1¾-2 in. long, acute, leathery, crimson, persistent, closely appressed to the capsule. Petals 3, yellow, linear about 4 in. long, acute, furnished with two small, toothed scales near the base on the inside, marcescent. Stamens 6, equalling the petals. Style shortly 3-lobed, a little longer than the stamens. Capsule 3-celled, oblong, 2-2½ in. long, acute, leathery, shining. Seeds very numerous comose at both ends, the basal coma reversed.

- W. BOTTING HEMSLEY.

Cultivation - The large Tillandsiae are handsome stove plants. Several of them have long been conspicuous objects in the tropical houses at Kew, and one of them,

*T. regina*, flowered in the Victoria house last year, where also the gigantic *Brocchinia cordylinoides* flowered about twenty years ago. They require tropical conditions, enjoying plenty of moisture at the root, the healthiest plants at Kew being those that stand on the tank in which the Victoria regia is cultivated, their pots being partly in the water. Here they receive full sunshine and as much moisture as they would get in a tropical forest. In the palm house the conditions are too dry for these plants. It is unfortunate that the whole of the upper portion of the plant dies immediately after flowering, but suckers are usually developed from the base of the stem, and these afford means of obtaining fresh stock. Under cultivation it takes these big species of *Tillandsia* about twenty years to reach the flowering stage.- W WATSON

## ***Guzmania* ‘Theresa’**

Opps! We messed up and a reader, Herb Plever, picked up our error. I must have really liked the plant because we published it twice and gave it two incorrect names.

To check the facts, we contacted Olive Trevor, the Society President and absolute expert in the area of bromeliad identification. Below is what Olive replied:

“On the front cover of the Sept/Oct 2010 edition we misidentified the plant. *Guzmania* ‘Theresa’ is the correct name for the plant

It is a very miniature version of a guzmania and quite distinctive. It is also pictured on the bottom right on the 4th page of the latest magazine Nov/Dec edition There it is called *Vriesea* ‘Titan.’. On the page over I have published the correctly labelled images of the plants”

Thanks Olive and Herb for clearing that up!

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## ***Neoregelia* ‘Big Bands’**

by Butcher Mar. 2011.

In the Jan 2011 issue of *Meristem* the Journal of the Caloosahatchee Brom Soc I found out some fascinating information about the *neoregelia* called ‘Oeser’s #100. About 1977, Joe and Peggy Bailey of Florida acquired a supposed unique *neoregelia* from a nursery in California.

In 1991 when Fort Myers horticultural artist, Kiti Wenzel was asked to create a poster for the 1992 WBC “Bromeliad Safari” to be held in Tampa Florida, Peggy provided a picture of the *Neoregelia* ‘Big Bands’ (also known as Oeser hybrid #100) as the model for the poster. It was reported in the Journal of the Bromeliad Society International, May-June 1992 issue that this plant was the only one of its kind and at that time was felt to no longer be in existence. Actually this is not true, because today

*Neoregelia* ‘Big Bands’ exists in many collections, at least in Florida gardens; and this is again due to the generosity of the Baileys. Another inconsistency was in the colour of the banding. Photographs on the Bromeliad Cultivar Register <http://botu07.bio.uu.nl/bcg/bcr/index.php> show a contrast with the one from Peggy Bailey showing gold/yellow banding as is the plant depicted in the poster by Kiti, whereas the other from *Tropiflora* shows light green bands. The description given to Don Beadle by Peggy Bailey for the 1998 edition of the Bromeliad Cultivar Registry – “Dark, rich red spotted and banded with chartreuse - irregular very distinct bands to half the upper leaves evident even in small offsets”. This suggests variation depending on what intensity of light the plant is subjected to.

Seeing the photo by *Tropiflora* remind-





*Guz.* 'Theresa'



*Vr.* 'Titan'



**Top left:** *Guzmania* 'Theresa' photographed at the 2010 Spring Show

**Top right:** *Vriesea* 'Titan' photographed at the 2010 Spring Show

**Bottom left:** *Neoregelia* 'Big Bands', photographed by P. Bailey - source: [http://fcbs.org/images/Neo/neo\\_Big\\_Bands\\_Bailey.jpg](http://fcbs.org/images/Neo/neo_Big_Bands_Bailey.jpg)

**Bottom right:** *Tillandsia usneoides*, this example photographed at the Olive Branch Bromeliad Nursery, July 2006.



ed me of a photo I took of 'Happy Thoughts' that was at one time known as his in turn had me looking at Oeser numbers and what had happened in the USA and Australia. It seems that about 1965 he sent packets of hybrid seed numbered 1 to 20 AND 100 to 111 to California without advising parentage.

How do I know this? When Don Beadle checked all records in his preparation of the 1998 Bromeliad Cultivar Register he followed the lead of Brian Smith (see Manuscript of Bromeliad hybrids and cultivars, 1984) where detail had been captured from Nurserymen's catalogues but he went further by recording which nursery was using the cultivar name AND the date. This way I was able to glean that the earliest references were coming from California! Oeser's hybrids seem to have been grown by several Californian nurseries but whether they went to one Californian who distributed the seed to interested people, it will never be known. What is strange is that he did not apparently quote any parentage and yet he did when sending seed to Australia!

No doubt you have asked yourself what happened to the numbers between 21 and 99. Well, we do know that we have seeds numbered between 40 and 60 by Olwen Ferris in New South Wales, Australia AND he divulged that they were a cross between *carolinae* and a hybrid of *chlorosticta*. Because one was a hybrid we know you would get variability even with one seed pod! Most of those selected out as being worthy of growing on and naming had spots! To see the 6 sibling names involved refer to 'Beefsteak' which was what we called the grex name in the 1980's. Alas, we do not have photos of them all. The photos of 'Happy Thoughts' are especially intriguing as mentioned before! I can see links between this and 'Big Bands' and it could well have similar if not the same parents.

From records currently held Oeser sent seed to Australia in this same period of

1. (*carolinae* x *chlorosticta* hybrid) which became 'Beefsteak' with 6 siblings
2. (*carolinae* x redleaf *carolinae* hybrid) which became 'Nomad' with 11 siblings
3. (*carolinae* x *chlorosticta*) which became 'Dark Delight' with 18 siblings
4. (*ampullacea* x *chlorosticta*) which became 'Jodie' with 7 siblings
5. (*ampullacea* x *carolinae*) which became 'Petite' with 3 siblings
6. (*chlorosticta* x ?) which became 'Red Marble' with NO siblings!!!

Let us now move to California where the US seed raising started and I regret to say that Peggy did not get a unique plant from the Californian Nurseryman. If it was Oeser #100 then the Californians called it 'Michelle'. So Oeser #100 had at least two names that we know of – 'Big Bands' and 'Michelle'. We do know that a plant called Oeser #100 was imported to Australia but we do not know by whom. All we do know is that in the 1980's the Butchers got hold of a plant of this name from Queensland and because it was not like 'Big Bands' called it 'Michelle' instead! We do know that 'Big Bands' got to Australia in 1987 because it is in the Pinegrove Ledger but who is growing it now?!

Oh, what a tangled web we weave! Dr Richard Oeser has much to answer for. Or, did I hear a chuckle from up in that Bromeliad Heaven because even after 45 years some of his hybrids are still being grown even if we do not really know their parents! Where else did he send hybrid seed? We think that New Zealand got at least one packet because of 'Bea Hanson'.

If this has a moral, it is that you are sure to create angst if you hybridise and let others raise the seed. Hybridising is not a game but a creation where the hybridist has responsibilities.



*Til. fasciculata* (chacalopa- Mexico)



*Tillandsia* 'Druid' cv 'Pink Champagne'

# **Book Review: Bromeliads Under the Mango Tree**

By Bob Reilly

This book was written, and published, by John Catlan from the Gold Coast, in 2009.

The book has 64, A5 pages. There are colour photographs of 41 bromeliads (mainly neoregelia hybrids) on the front and back covers, but not elsewhere in the book.

Bromeliads Under the Mango Tree is primarily an introductory book on growing bromeliads. The book's Table of Content lists the various topics.

The cultural topics include:

- The distinction between species and hybrids.
- Potting mixes.
- Fertilising.
- Water requirements.
- Removing pups/offsets

More "advanced" topics include:

- Factors that induce variegation.
  - Adventitious pups.
  - Premature flowering.
  - Trichomes.
  - Leaf colouration in neoregelias.
- (This is one of the best, largely non-technical, summaries of this topic that is available anywhere in the world. This topic is, by itself, worth the book's purchase price, if you grow neoregelias).

Each of the topics is self-contained and can be read in less than five minutes. However, I suggest you re-read these topics periodically, because of the information packed into most of them.

John Catlan has given many informative talks to society monthly meetings and bromeliad conferences over the years. Many of the topics covered in those talks are contained in this book.

Overall, this book is highly recommended by anyone growing bromeliads.

Date of review: 2010

# **Book Review: Tillandsia II**

by Bob Reilly

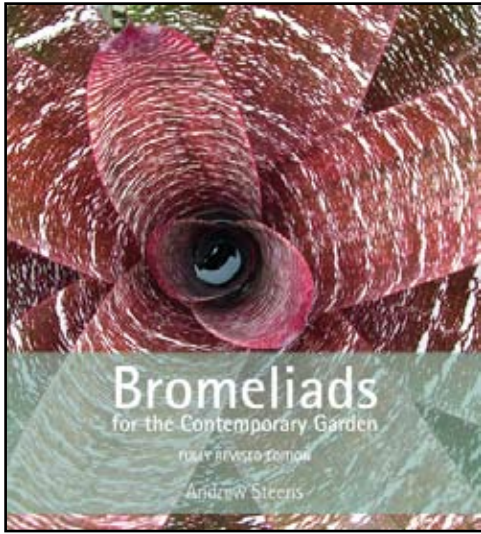
Tillandsia II is written by Paul Isley III. It was published by Botanical Press in the United States of America in 2009. This book is largely a revision of Tillandsia which was written by Paul Isley and published in 1987.

Tillandsia is out of print and second hand copies cost well in excess of Tillandsia II's purchase price. However, if you have Tillandsia, I suggest you look at Tillandsia II to see if there is enough new material in it to justify the purchase price. Having said that, I have Tillandsia and consider it well worthwhile to purchase Tillandsia II.

The book opens with a description of tillandsias' physical characteristics and their cultural requirements. While the advice is generally useful, some care needs to be taken in its application to sub-tropical and tropical growing conditions. Further, many of the recommended growing aids, e.g. fertilisers, are not available in Australia.

The next chapter describes 61 species. In each case there is a description of the plant, its habitat and some advice on cultural requirements. The text is supported by excellent photographs of the flowering plant. Collectively, these species would make a good tillandsia collection. All are available in Australia.





Above right: *Tillandsia utriculata* -grown by Greg and Narelle Aizelwood and shown by them at the 2010 Spring Show

Below: *Tillandsia wagneriana*, this example was on sale at the recent Spring Show and marked as



The next chapter has photographs of flowering plants of over 70 tillandsia hybrids. This chapter is a major expansion of the corresponding chapter in the 1987 book. Several of the featured hybrids have been made by Australian hybridists. For each hybrid, there is a photograph of the flowering plant, but no other information. While this is a weakness, it is a reasonable trade-off, if the choice would have been to cover fewer hybrids (because of space constraints).

The next chapter has photographs of a range of additional species and hybrids. Most of these are tillandsias, but there are also ones of other genera.

The next chapter outlines a somewhat eclectic mix of people who have contributed significantly to tillandsia taxonomy. An Australian, Derek Butcher is last, (but not least I hasten to add!) in this line up.

There then follows chapters on tillandsia taxonomy, their evolution and biology. It concludes with a comprehensive glossary and index.

This book is probably best suited for the tillandsia grower who has some knowledge of the subject, but is looking to take their understanding to the next "level". Experienced growers will also find much of interest.

Date of Review: 2010

**Book Review:  
Bromeliads for  
the Contemporary  
Garden (Completely  
revised [ 2010]  
edition)**

This book was written by Andrew Steens. It was published, in Australia, by

Florilegium (65 Derwent St, Glebe, NSW, 2037; email: sales@florilegium.com.au); and elsewhere by Random House.

Andrew Steens grows bromeliads in New Zealand. Not surprisingly, the book reflects this perspective. (Although a much stronger sub-tropical emphasis is evident in this edition, than in the first one). Hence, elements of the book need to be treated with some caution in a sub-tropical environment. For example, I would not attempt to grow *Vriesea fosteriana* 'rubra' in full sun (p.61) in the sub-tropics, while many puyas are not extremely hardy (p.258) in the coastal sub-tropics.

Having said that, this book is the most comprehensive introduction to growing bromeliads available today. Experienced growers will also find much of interest in it.

The book has nearly 400 pages, and around 500, high quality, photographs. A high standard of accuracy in matters such as plant names and descriptions has been achieved.

In the first chapter, an overview is given of the bromeliad family and their native habitats. It is followed by an informative chapter on landscaping with bromeliads. The section on growing bromeliads on rocks is the best that I have seen on this topic.

Most of the book is a listing of around 250 species and hybrids, from 24 genera and 4 bi-genera. Many of these plants are illustrated with colour photographs, and all are well described in non-technical language. Nearly all of these bromeliads are readily available in Australia. The sections dealing with aechmeas, dyckias, neoregelias, nidulariums, puyas, and quesnelias are particularly comprehensive in their coverage.

The next chapter deals with bromeliad cultivation. While nearly all of the material is applicable, some caution is needed when applying the advice (for example, on watering and sun exposure) to sub-tropical conditions.

Particular care should be taken if you live in the wet tropics. All of the major topics relevant to growing bromeliads, for example, watering schedules, pest/disease recognition and control, propagation and fertilising are well covered in non-technical language.

The book concludes with a comprehensive index.

It is excellent value for money. The photographs alone are worth the purchase price. However, this book is much more than just a compilation of photographs.

Overall, the book is highly recommended.

Book review date: December 2010

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# Cold Sensitivity in Bromeliads

by Andrew Steens

*(Reprinted, with permission, from the Journal of the Bromeliad Society (2000), v.50 (4), pp 153-154)*

Bromeliads are surprisingly hardy. Most people think of them as being tropical plants which are unable to be grown outdoors in most areas of New Zealand and other parts of the temperate world. In fact, many bromeliads can survive frosts of minus 7°C (19°F), which we have recorded in the early 1990's here in New Zealand in gardens with plants such as *Aechmea apocalyptic*, *Billbergia nutans*, *Canistropsis billbergioides*

and others. On the other hand, *Guzmania zahnii variegata* will start showing cold spots when the night temperatures drop below 10°C (50°F).

Cold sensitivity is variable though. It is affected by the overall condition of the plant (for example its nutrient status), the light levels received, and temperatures preceding the cold period. The placement of plants in the garden also has a marked effect, with overhanging foliage or proximity to a building being quite beneficial. Also, both the duration and intensity of the cold period and the moisture level of the air have an impact.

An early cold snap, particularly one that has been preceded by warm temperatures, is more damaging than one that occurs late in the winter.

Even in a greenhouse some of these

### The following were considered some of the factors that impact the cold sensitivity of bromeliads:

Factor	Impact	Reason
High nitrogen levels	Negative	Lush growth with low resistance
Low nutrient levels (other than nitrogen)	Negative	Poor resistance to cold
Low light levels	Negative	Produces weak, thin Leaves
Overly wet Soil	Negative	Produces poor root growth
Poor air movement	Negative	Cold wet air is trapped around plants
Lengthy cold period	Negative	Plant resistance deteriorates with time
Planting in hollows & valleys	Negative	Cold air settles in low areas
Overhanging foliage	Positive Negative	Prevents frost May restrict air movement
Nearness to buildings/structures	Positive	Buildings retain heat longer
Planting on upper slopes & banks	Positive	Cold air flows downward
Planting among rocks	Positive	Rocks retain heat longer





*Ae. correa-arujei x canistrum seideliaum*



*Ae. chantinii* 'Stripe on Stripe'



*Aechmea nudicaulis*



## Carnivorous Bromeliads

factors are important. Increasing the cold resistance of your plants will allow you to decrease the heating level, thereby reducing your costs. Factors such as correct nutrition, light levels, air movement and placement are all important in greenhouse situations. Leading into winter, it is good practice to prepare your plants by cutting back on nitrogen fertilizers. Consider applying foliar feeds which are high in potassium and low in nitrogen.

Improve air movement and light levels by reducing the amount of overhead shade (without exposing the plants to frost) and prune away dense foliage surrounding your bromeliads. Consider which plants are most susceptible to cold, wet conditions and consider moving these to a bank, near a building or even indoors for the winter.

Frosts occur most often around the full moon when the weather is settled, especially at times with little wind and clear skies. Keep an eye on the weather forecasts. If frost is predicted, set your alarm for at least an hour before daybreak and start watering! Don't stop until at least ½ hour after daybreak, when the sun starts to warm the plants (or later in shaded areas). Spraying water over plants is a long established method of preventing frost settling and is surprisingly effective.

The Journal of the Bromeliad Society, in an article by Dale Jenkins (reprinted from the Sarasota Bromeliad Society Newsletter), provides a comprehensive list of cold sensitivity by individual species and cultivars. Use this to determine the requirements of your collection. The list can also be found on the web site of the Florida Council of Bromeliad Societies at <http://fcbs.org>.

Are any bromeliads carnivorous? The jury is still out; and the verdict will probably depend on the criteria necessary to establish carnivory.

The general definition of carnivory requires four conditions:

- Active attraction of insects.
- A structure to trap and confine the insects.
- Active secretion by the plant of enzymes to digest the insects especially proteases and phosphatases to release the nitrogen and phosphorus.
- Active absorption of the released nutrients.

In the Bromeliaceae, the current species listed as carnivores are *Brocchinia reducta*, *Brocchinia hechtoides* and *Catopsis berteroniana* with two more unnamed *Brocchinias* as possible candidates.

The *Brocchinias* are terrestrials and are native to the nutrient poor acid bogs of southern Venezuela, Guyana and Brazil; with some growing on bare rocks on highland tepuis.

*Catopsis berteroniana* is an epiphyte and native to the Florida everglades and into northern South America. Healthy plants produce a rosette of loosely packed leaves. The leaves are so bright yellow that the plant almost appears to glow. The leaves are also coated with a waxy, powdery white cuticle that enhances the effect. The image is so suggestive of a lamp placed on the bare branches of a tree that in South America it has earned the common name *lampera de la selva* (jungle lantern). These plants have leaves which are waxy and slippery which minimises the

escape of insects.

Using the descriptors of Adrian Slack\*, these bromeliads would be called passive pit traps (passive: no moving organs as with the Venus Fly Trap or the acquatic bladderworts: pit traps: a simple open leaf structure receptacle but with some development of properties to prevent the escape of insects).

All tank bromeliads will have some insect residues in the leaf axils or central tank. Examination of the nature and quantity of the solid residues of non aquatic insects will give an indication whether there is an active attraction or just random trapping.

The question as to whether these bromeliads actively secrete enzymes to release the nutrients or whether any release is from passive digestion by bacteria is the subject of discussion and will probably determine whether these species will be classified as true carnivores.

Compiled from various internet sources  
by Peter Paroz

.....  
'Carnivorous Plants' by Adrian Slack

## **Bromeliaceae/ Bromeliad Newsletter Two journals?**

The Bromeliad Society of Queensland produces the above two publications and they fill different niches for members. The "Bromeliad Newsletter" is a electronic publication containing information on the ephemeral information like plant competition results, reports on society activities, and a more complete Calendar of Events.

"Bromeliaceae" on the other hand is a substantive journal more akin to a small book. It contains articles on the horticultural aspects of growing bromeliads, descriptions of different bromeliad species and cultivars and book reviews to name but a few of the topics covered by this journal. It is available both in electronic and hard copy forms

Just a quick summary, but I think that gives the general overview of where both are targeted.

## **Calendar of Events**

**7th May - 2011 Cryptanthus Workshop** - 22 Canvey Rd, Upper Kedron (at Olive and Len Trevor's home). Program 8-9 am Set-up Sales Area, 9am Basic Cultivation Techniques, 10:30 Morning Tea, 10:45 - 3:30 Workshop Presentations, 12:30 Lunch and Plant Sales, 3:30 Wrap up plant sales and Silent Auction, 4pm Finish and clean up. You will need to register with Greg Aizlewood 5546 1161

**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



Guz. 'Patricia'