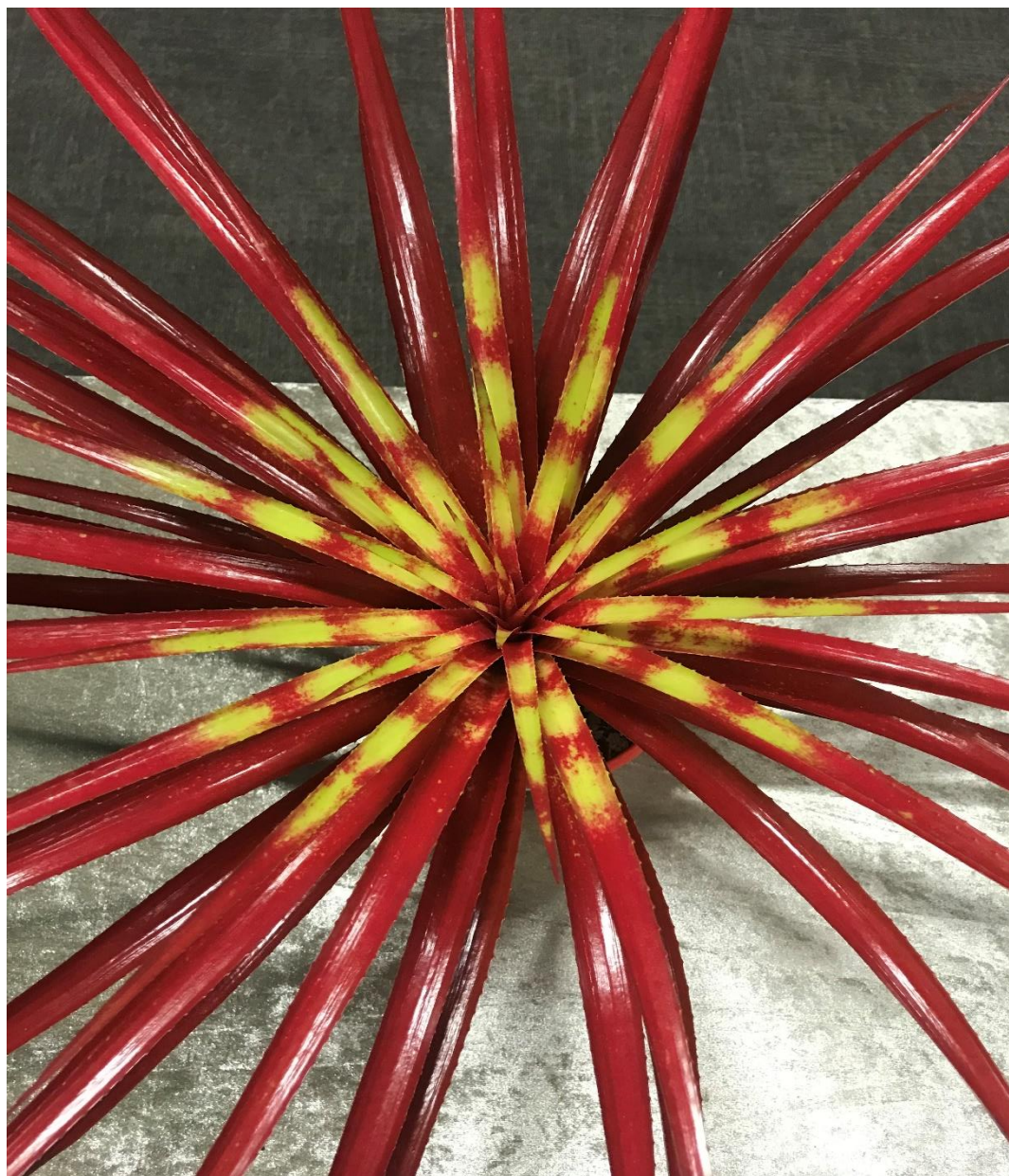


**ILLAWARRA BROMELIAD SOCIETY  
INCORPORATED**

**NEWSLINK**

**April 2020**



*xSincoregelia 'Birchwood Golden Eye'*  
A beautiful bigeneric hybrid recently created by  
Nigel Thomson of Queensland  
Photograph by Edwina Wain

Articles appearing in this issue of *NEWSLINK* are for information purposes only and are not necessarily endorsed by the Committee or the Illawarra Bromeliad Society.

- The Society is, by the holding of meetings, displays and competitions, to provide a forum for the people of the Illawarra region who are interested in the culture and collection of bromeliads.
- Under the provision of the Privacy Act use of names and references to private details, such as illness, holidays, birthdays, and items of a similar nature, may only be published with the written permission of the person concerned.

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**BANK DETAILS FOR FEE PAYMENT, ETC:** Illawarra Credit Union; BSB No. 802249; Account No. 249 039 602

**MEETINGS** - The Society meets at 12.00 noon on the first Saturday of each month (except January and December) in the Laurel Room\* at the Ribbonwood Centre, DAPTO. \*Scribbly Gum room for November meetings only.

**MEMBERSHIP SUBSCRIPTIONS** - Due 30<sup>th</sup> June each year: \$15 single/\$25 family.

**NEWSLINK ISSUED QUARTERLY** - January, April, July, and October and at <http://www.bromeliad.org.au>

**VISITORS ARE ALWAYS WELCOME**

**NEW MEMBERS:** A very warm welcome to our new members Jenny Starling who signed up in December and Jenni Wenzel who joined our Society at our March meeting. We wish you a long and happy association with us!

**COMPETITION RESULTS FOR 2019: AN APOLOGY!**

I must apologise to Rhonda Patterson who took out the Open Points Score Award in 2019—a well deserved win—because I had incorrectly reported Ann Kennon as taking out this Award. However, Ann did take home the Tillandsia Trophy and I must thank Barbara for arranging for the very beautiful individual trophies which were awarded to our winners this year.

**MONTHLY RAFFLE PRIZE ROSTER:** Should you be unable to provide items for the raffle on your rostered day please contact the Program Officer (Bob Stephens, Mob. 04 1283 4985) so that appropriate re-arrangements can be made.

July - Barbara Jones-Beverstock, Deniece Crutchley, Brian Smith, Maadi McKenna

**ROSTER FOR CLEANING UP AFTER THE MEETING:**

July - Maureen Wheeler, John Boyd, Ron Hurry and Faye Lloyd

**CANCELLATION OF ACTIVITIES:** A lot has changed since our last meeting and so now with the directives from our Government we will be in lockdown for at least the next 90 days. I hope that you are all well and taking precautions to stay that way as there is no telling how long this epidemic/pandemic may last or when we will be able to meet again.

It was decided by our committee that our April and May meetings be cancelled—also our planned workshop for April 18. The garden visits scheduled for May 16 have been postponed for the time being, but perhaps we might have the opportunity to visit Pam and Sandra's gardens later on in the year. Also, under the 90 day self-isolating period, it is likely that our June meeting will be cancelled but if we are to return to our meetings in July, then for July 4 it will be Soup 'N Sweets and a fancy hat competition.

Other events, previously advertised—including the Bromeliad Society of Australia's Autumn Show and the Corrimal Garden Club's proposed visit to Bilpin—have been cancelled, and the World Bromeliad Conference which was to have been held in Sarasota, FL in June of this year has been postponed until June 8-12, 2021. Same venue/same price.

As you will recognise, everything regarding our Society's activities is uncertain at this time but you will be advised by email when we know more. As I'm unable to get to Officeworks for printing up of *Newslink* I will send this April issue electronically; however, I will have the hard copies ready for distribution when things are safer to do so.

All being well, upcoming events to look forward to will be:

<b>Sep. 12 - 13 <u>2021</u></b>	<b>ILLAWARRA BROMELIAD SOCIETY SPRING SHOW – Uniting Church Hall, CORRIMAL</b>
<b>April 8 - 11</b>	<b>KIWI BROMS – 21<sup>ST</sup> AUSTRALASIAN BROMELIAD CONFERENCE, AUCKLAND, NZ</b>
<b>June 8 - 12</b>	<b>WORLD BROMELIAD CONFERENCE 2021 – THE BIG SHOW – HYATT REGENCY HOTEL, SARASOTA, FLORIDA with tours to two of the world's leading bromeliad nurseries—<i>Michael's Bromeliads</i> and <i>Tropiflora</i>.</b>

**PHOTOGRAPHIC COMPETITION:** Hopefully, this will be on again this year and, if so, the "Conditions of Display" are set out below.

## THE MERI STEFANIDAKIS MEMORIAL TROPHY

Awarded for the photograph in the Annual Photographic Display  
that best captures the spirit of the culture of bromeliads

### CONDITIONS OF THE DISPLAY

- The Illawarra Bromeliad Society Inc. shall hold a Photographic Display each year.
- The Display will be held at the November General Meeting.
- Entry in the Display is restricted to members of the Society and all members are eligible to enter.
- The subject of the photographs must concern some aspect of the culture of bromeliads.
- Each member may submit up to three photographs.
- Each photograph must be taken in the year of the Display and by the member submitting it.
- The photographs must be “postcard” size (10 cm x 15 cm) and may be in colour or black and white.
- The orientation of the photograph may be portrait or landscape.
- A border on the photograph is optional.
- The photographic print may be made commercially or by the member submitting it.
- Entries must be submitted to the Competitions Officer of the Society in a plain envelope before conclusion of the October General Meeting of the Society.
- Each photograph must be submitted in a separate envelope, have a sticker on the back showing the name of the member submitting it, and be accompanied by a separate 5 cm x 10 cm card showing the date the photograph was taken, and a suitable title for the photograph. Nothing else.
- Any photograph that does not conform to the requirements set out here will not be eligible for entry.
- The Competitions Officer will arrange for the entries to be displayed for inspection and judging by popular vote at the November General Meeting.
- In judging this competition, members are urged to apply “awarded for the photograph that best captures the spirit of the culture of bromeliads” to the best of their ability.
- The results of the vote will be announced at the December General Meeting and the member who took the winning photograph will be awarded the Trophy for that year.

### NEWSLINK INDEX

By Drew Maywald

*(When I contacted the Far North Coast Bromeliad Study Group for permission to reprint the article on protecting label information (which appeared in our January 2020 Newslink) I had a reply from Drew Maywald who had provided this information for the FNCBSG members. At that time Drew was kind enough to offer to set up an Index for our Newslinks (and thanks to Michael who had already scanned copies dating back to 1992 and was able to forward these on to Drew) and so we now have an up-to-date listing of all of the articles which appeared in our newsletters and Drew will continue to update the list as he receives future copies. Thank you very much Drew for all of the work that you have put into this—and thanks also to Michael who gives me great support in helping me ready our newsletters for electronic distribution. Ed.)*

An Index of all copies of the Illawarra Bromeliad Society *Newslink* journal is now complete and available to all members. Access to the Index is via the link on the club’s web site [www.bromeliad.org.au]. To access the index, click on the link:

 [Newslink Index](#)

This will take you to the home page of the index.



### Illawarra Bromeliad Society Newslink Index Table of Contents

The Illawarra Bromeliad Society is proud to be affiliated with the Bromeliad Society of Australia (BSA) Inc.

To Access the Contents: Put your mouse cursor over the Contents Item you require and click on the link displayed

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<https://drive....AhsNmRy1mzSow>

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Created by Drew Maywald: drewmaywald@gmail.com

Instructions on how to use the index are contained in each folder in the index. This link is a View Only link, so users will be able to navigate around the index and conduct searches but they will not be able to change any of the details in it.

The index consists of a number of folders which can all be accessed by hyperlinks. To go to a folder simply put your mouse cursor over the folder you want to see, e.g. [Articles](#), and click on the link which will be displayed, e.g.:

[#gid=2024523714](#)

Each folder has been organized alphabetically, and once you are in a folder you can simply scroll down to access the entry you require, or you can conduct a search by pressing <Control F> on your keyboard. A search box will appear in the top right of the screen. Enter the topic of your search which can be an article or plant name, author, part of a name, or any other detail. Scroll down the folder to see all the results of your search which will be highlighted in green. Click on the X on the right of the search box to close it.

All the folders on articles and plants are set out the same way, and each entry contains a link to the relevant journal, so that you can read the article or see the drawing in the relevant *Newslink* edition. Once you have finished with a particular folder return to the home page by using the "Return to Contents" hyperlink.

The Articles folder contains an index to all *Newslink* articles, descriptions and discussions. Each of the plant folders contains all the information about a specific genus, but also includes a list of photographs and drawings, with links to the relevant *Newslink*.

The index also includes quite a large glossary of terms based on Derek Butcher's glossary. To find a term you can simply scroll down to the entry you require, or use the alphabetical hyperlinks on the right of the Glossary folder, or simply conduct a search by pressing <Control F> on your keyboard.

I will continue to maintain the index and add details from future editions of *Newslink* to it. However, should you have any feedback about the index or ideas on how it can be improved (for example, include a list of documents that can be accessed by members), please contact me at [drewmaywald@gmail.com](mailto:drewmaywald@gmail.com).

Drew Maywald

March 2020

## **February 1, 2020: Competition Plant Results**

### **Open:**

1 <sup>st</sup>	Steve Wain	<i>Aechmea</i> 'Pilfered'
2 <sup>nd</sup>	Bob Stephens	<i>Vriesea</i> 'Splendret'
3 <sup>rd</sup>	Ann Kennon	<i>Billbergia</i> 'Domingos Martins'

### **Novice:**

1 <sup>st</sup>	Glenn Martin	<i>Vriesea gigantea</i> var. <i>seideliana</i> (aka 'Nova')
2 <sup>nd</sup>	Fran Parrott	<i>Aechmea</i>
2 <sup>nd</sup>	Glenn Martin	<i>Aechmea fasciata</i>

### **Tillandsioideae**

1 <sup>st</sup>	Steve Wain	<i>Tillandsia capitata</i> 'Marron'
2 <sup>nd</sup>	Ann Kennon	<i>Tillandsia xerographica</i>
3 <sup>rd</sup>	Suzanne Burrows	<i>Tillandsia streptophylla</i>

## **March 7, 2020: Plant Results**

### **Open:**

1 <sup>st</sup>	Ann Kennon	<i>Aechmea</i> 'Bert'
2 <sup>nd</sup>	Jan Stammers	<i>Neoregelia</i> 'Stars and Stripes'
2 <sup>nd</sup>	Bob Stephens	<i>Guzmania</i> hybrid
3 <sup>rd</sup>	Ann Kennon	<i>Dyckia</i> 'Port Wine'
3 <sup>rd</sup>	Bob Stephens	<i>Billbergia vittata</i>

### **Novice:**

1 <sup>st</sup>	Ana Mallon	<i>Neoregelia</i> 'Wild Rabbit'
2 <sup>nd</sup>	Glenn Martin	<i>Neoregelia</i> 'Takizawa Princeps'

### **Tillandsia:**

1 <sup>st</sup>	Ann Kennon	<i>Tillandsia magnispica</i>
2 <sup>nd</sup>	Glenn Martin	<i>Tillandsia straminea</i>
2 <sup>nd</sup>	Michael Drury	<i>Tillandsia</i> 'Confusion'

## **CULTURAL HINTS FOR BROMELIAD GROWERS**

(This article, by the late Carol Johnson is reprinted from the Bromeliad Society of San Francisco's March 2009 newsletter which in turn was extracted from the March 2003 newsletter of the Houston Bromeliad Society.)

***Aechmea*:** Each species in the genus should be considered separately since the habitat covers nearly every geographic area where bromeliads are found. The *aechmeas* of Brazil, Bolivia and Chile are hardier than those from Central America, the Caribbean and Amazonian South America. Some require feeding, some are hurt by application of fertilizer. Nearly all do well when mounted provided they are started young, before the plants are heavy. But remember that mounted plants require daily care indoors. Plant sizes range from very small to very large. Plants which will ultimately be large should be weighted at potting time with rocks in the bottom of the pot. After blooming many *aechmeas* produce colourful, attractive seeds, all of which are edible.

**Billbergia:** With few exceptions this genus should be protected from freezing. Plants should be underpotted and fertilized very sparingly. Overfeeding produces lush, green growth at the expense of foliage colour and it may take two generations of pups before colour is restored. Those from subgenus *Helicodea* are the least cold hardy. Subgenus *Billbergia* species nearly all bloom during the winter months when their blooms, though fleeting, are welcome.

**Androlepis, Ananas, Araeococcus, Orthophytum and xSincoregelia:** These have all been lumped together since they seem to thrive on similar treatment. *Androlepis* and *Ananas* (pineapple) are large plants, the others more manageable in size. All require strong light, rich soil, generous pot size, regular feeding, and plenty of moisture. Most prefer warm weather and growth is slowed during winter months.

**Quesnelia, Hohenbergia, Portea, and Streptocalyx** (since disbanded, the majority of the species have now been transferred to *Aechmea*, with two to *Portea* and two to *Ronnbergia*—Ed.). There are some big, mean plants in these four genera. *Quesnelia* is the most cold hardy, most surviving outdoors under trees in Central Florida. *Portea* is the next hardiest, while *Hohenbergia* and *Streptocalyx* are always very tender. Strong light and cessation of feeding when the plants are mature produces best foliage colour and promotes blooming. Be selective growing hohenbergias. Many have nothing but size to recommend them, having green foliage and colourless blooms. *Streptocalyx* have very spiny leaves, but are extremely beautiful in bloom. Grow warm, on the dry side, and furnish lots of light.

**Canistrum, Cryptanthus, xCanmea and Nidularium:** Here again, these take similar treatment. Cryptanthus are always terrestrial, but the other three can be grown mounted. All like rich soil, plenty of moisture, and should be fertilized regularly. A fairly low light level is important. Crypts and xCanmea do best in 60% shade; the rest tolerate even lower light levels. Nidulariums are tolerant of cold, wet conditions, and are greatly underrated. They are great as poolside specimens or under shrubbery in the yard. Because they resemble neoregelias they are often grown the same and the result is disappointing. Don't be alarmed if they drop lower leaves. This is normal for the genus. Treat canistrums as nidulariums.

**Neoregelia:** Offsets of neoregelias from the same plant, grown by two different people in different areas, can mature with very little resemblance to one another. The plants are very sensitive to light, fertilizer, and pot size and these make a world of difference in the finished plant. Most do best when underpotted and underfed, grown on the dry side, and here in Florida subjected to as much strong light as they can endure. Fifty percent shade is always safe. With good growing conditions the neos give more satisfaction with less work than many other bromeliads. Offsets should not be taken or potted during short days.

**The Pitcairnioideae:** This subfamily was the forerunner of all bromeliads, evolving in the deep past from the grass family. All (*Dyckia*, *Hechtia*, *Deuterocohnia*, *Fosterella*) are terrestrials requiring copious amounts of water and fertilizer when grown as pot specimens. Either water daily or grow standing in saucers of water. *Dyckia* is from Brazil and very cold hardy. Hechtias are native from Texas through Central America and are extremely tender. Pitcairnia are becoming more popular, even though the foliage is often grassy and sloppy. Blooms are spectacular red, yellow, or orange. *Pitcairnia* habitat is damp creek banks and shady locations. They seem to enjoy a dormant, dry recess for several months during winter, which forces blooms when watering is resumed. Dyckias and hechtias should be grown in strong sunlight and since they have enormous root systems they need to be overpotted.

**Tillandsia:** Collectors visualize tillandsias as dry-growing, sun-loving epiphytes. That is the exception rather than the rule. Those with the heaviest coat of peltate (fuzzy) scales will survive dry conditions best, but this is their mechanism for extracting moisture from the air. All of the tillandsias need moisture. In the wild, many grow on tree limbs where they are protected by the foliage, nourished by bird droppings and leaf mould. Do not treat them all the same. Research the habitat and treat accordingly. Greenhouse grown plants require applications of liquid fertilizer. Size span is ½ inch to 7 feet.

**Guzmania:** Low light, warm air, plenty of plant food, and moist pot space. Guzmanias are truly tropical plants and frustrating for many new growers. Neglect of any sort is intolerable. Feed heavily and keep in a constant stable environment. The guzmania hybrids are easier to grow than the species and usually more spectacular. Grow outdoors at your own risk.

**Vriesea:** These are the aristocrats of the **Bromeliaceae**. They come small and huge, with plain green or exotically patterned and colourful spineless foliage. The plants look fragile, but are probably the hardiest of all bromeliads. They have shallow root systems and should, therefore, be fed through the leaves with liquid fertilizer. Dry conditions are better tolerated than wet, but surrounding air should be moist and cool. Some like strong light, but the general rule is 60-65% shade. Small to medium-size green-leaved vrieseas make the best showing when allowed to clump, and their bloom season is late winter.

## THE FAMILY *BROMELIACEAE*

When I first printed up an article similar to this in the October 2013 *Newslink* I was prompted to print up the following reference guide because I wondered if a lot of us, like the lady attending the World Bromeliad Conference in Cairns and visiting Peter Sargent's beautiful Whyanbeel Arboretum, when told that the beautiful clump of plants that she had been admiring was *Portea kermesina*, said, "Oh, but I thought they were bromeliads!" Well, while perhaps most of us might be familiar with *portea*, *Disteganthus*, *Steyerbromelia* and *Deinacanthos* would possibly be genera that we had never run across before.

New technologies have persuaded botanists to make many changes, causing some genera to be transferred to within other genera—e.g., *Pepinia* being swallowed up into *Pitcairnia* and the one species previously known as *Andrea selloana* has now become *Eduandrea selloana*—and since I first reprinted this article there have been many changes to the sub-families of *Bromeliaceae* and there are many more changes in the wind. However, as we have had quite a few new members join us since the article was printed—and to perhaps help make it easier for us to understand Michael's March presentation on bigenerics—I hope that this revised edition will provide you with some better idea of what our wonderful world of bromeliads has to offer us! Perhaps about 90% of these different genera are represented in collections throughout Australia.

When I included the earlier version of the Table in 2013, it represented the 3 sub-families of *Bromeliaceae*—*Tillandsioideae*, *Pitcairnioideae*, and *Bromelioideae*—differentiated by the way in which they set seed.

***Tillandsioideae*:** Have winged seeds with little, silky, featherlike parachutes that enable the seed to be borne aloft by the breezes. Also, members of the *Tillandsioideae* sub-family have no spines.

***Pitcairnioideae*:** Have winged seeds, but without the 'parachutes'.

***Bromelioideae*:** Have berry-like fruit, adopted for dispersal by birds or other animals because of food value or stickiness. Another distinguishing feature is that all genera within this group have spined leaves.

However, more recently, the sub-family ***Pitcairnioideae*** has been split up into six new sub-families, namely:

- ***Brocchinioideae***  
Included genus: *Brocchinia*
- ***Lindmanioideae***  
Included genera: *Connellia*, *Lindmania*
- ***Hechtioideae***  
Included genus: *Hechtia*
- ***Puyoideae***  
Included genus: *Puya*
- ***Navioideae***  
Included genera: *Brewcaria*, *Cottendorfia*, *Navia*, *Sequencia*, *Steyerbromelia*
- ***Pitcairnioideae***  
Included genera: *Deuterocohnia*, *Dyckia*, *Encholirium*, *Fosterella*, *Pitcairnia*

The number of species for each genus varies from say one for *Andrea* and *Androlepis* to around 700 for *Tillandsia*, with great variation in between. The new genera added quite recently are the result of new technology, including DNA sequencing.



**Sub-family Tillandsioideae***Alcantarea**Barfussia*\**Catopsis**Glomeropitcairnia**Goudaea*\**Gregbrownia*\**Guzmania**Jagrantia*\**Josemania*\**Lemeltonia*\**Lutheria*\**Mezobromelia**Pseudalcantarea*\**Racinaea**Stigmatodon*\**Tillandsia**Vriesea**Wallisia*\**Werauhia**Zizkaea*\*

\*Recently added genera to the *Tillandsioideae* sub-family.

**Sub-family Pitcairnioideae***Deuterocohnia**Dyckia**Encholirium**Fosterella**Pitcairnia***Sub-family Brocchinioideae .***Brocchinia***Sub-family Hechtioideae .***Hechtia***Sub-family Lindmanioideae .***Connellia**Lindmania***Sub-family Navioideae, .***Brewcaria**Cottendorfia**Navia**Sequencia**Steyerbromelia***Sub-family Puyoideae .***Puya***Sub-family Bromelioideae***Acanthostachys**Aechmea**Ananus**Androlepis**Araeococcus**Billbergia**Bromelia**Canistrum**Canistroopsis**Cryptanthus**Deinacanthos**Disteganthus**Edmundoa**Eduandrea**Fascicularia**Fernseea**Forzzaea**Greigia**Hohenbergia**Hohenbergiopsis**Hoplocryptanthus**Karawata*\**Lapanthus**Lymania**Neoglaziovia**Neoregelia**Nidularium**Ochagavia**Orthophytum**Portea**Pseudaechmea**Pseudananas**Quesnelia**Rokaustskyia**Ronnbergia**Ursulaea**Wittrockia*

\*Includes 7 species recently moved from the subgenus *Aechmea Chevaliera*

## BIGENERIC BROMELIADS

Compiled by True Grant (Reprinted from **Bromlink**, March-April 2018 #2, newsletter of the Gold Coast Succulent & Bromeliad Society Inc.)

Bigeneric bromeliad refers to a hybrid between bromeliads of two different genera. The term intergeneric refers to the next step when three or more different genera are involved.

Most hybrids are between bromeliads within the same genera (e.g., *Vriesea* X *Vriesea* or *Neoregelia* X *Neoregelia*). In some cases, growers are able to cross different genera as well. Most of these crosses are not likely to happen in nature, but experienced horticulturists have discovered techniques for propagating these unique hybrids. These hybrids, called bigenerics or intergenerics, are indicated with an x in front of the new genera name to distinguish them from standard, botanically described genera names (e.g., x*Neomea*).

Geoff Lawn, in an article posted by the Florida Council of Bromeliad Societies, states the following: “Bromeliad bigenerics are virtually unknown in the wild because fertility barriers, different blooming times and geographic range prevent most species in different genera from cross-breeding by specialised pollinators. Even in large cultivated mixed collections where breeders can try many combinations, there are no readily available records on the success/failure ratio of attempts, probably because hybridists work mainly in isolation and we tend to hear only of the progeny which survived and were not culled. Certainly pollen storage assists with otherwise non-simultaneous flowering parents but the biggest obstacle to success appears to be still genetically-incompatible “partners”—the potential parents’ genes simply don’t mix, at least not with current plant-breeding technology.

To date (March 2018), the *Bromeliad Cultivar Registry* lists approximately 580 different bigenerics within 41 genera and 73 bigeneric groups. To be expected, every bigeneric has been produced from two genera within one sub-family, never *Bromelioideae* crossed with *Tillandsioideae* or *Pitcairnioideae* (or combination thereof)—their biological differences are just too great and cause rejection.

It is often quoted that all bigenerics turn out sterile (“mules”—i.e., they can’t be reproduced from seed), which may be true in most cases. However, the first intergeneric has just been registered by Geoff Lawn: x*Hohenquesmea* ‘Valley Hoodoo’ which is x*Quesmea* ‘Nifty Nev’ X *Hohenbergia rosea*, therefore *Quesnelia* X *Aechmea* X *Hohenbergia*. These are all in the subfamily *Bromelioideae*. The hybridiser is Aaron Smythe from Queensland.

Initially, the majority of bigenerics have been primary crosses (i.e., species X species) and those parents which are least alike tend to produce the most distinctive offspring. Dominant and recessive characteristics play a role in individual crossings, with some progeny intermediate between both parents, while other hybrids appear more like their seed parent OR pollen parent, at least at species level. The genetics with bigenerics are more complex with hybrid X hybrid or hybrid X species pairings, producing a mixed range of siblings even from the same seed batch.

Bigeneric genera names have “x” inserted before each genus to distinguish them from standard, botanically-described genera names.

We have both gained and lost bigeneric genera through botanical reclassification of their parent genera or individual species within. For example, x*Pitinia* (*Pitcairnia* X *Pepinia*) no longer exists because most botanists agreed that all *Pepinia* species be transferred back to *Pitcairnia*. x*Nidumea* ‘Beacon’ became x*Aechopsis* ‘Beacon’ when one of its parents, *Nidularium burchellii*, became *Canistropsis burchellii*. Some coined bigeneric genera names have had to be standardised (alternate first and last syllable of both genera names combined). For example, the combination *Nidularium* X *Neoregelia*, now x*Niduregelia*, used to be called x*Neolarium*.

## THE EVOLUTION OF BROMELIADS

Extracted from *Wikipedia*—an article titled *Bromeliaceae* <en.wikipedia.org>

Accessed March 9, 2020

Bromeliads are among the more recent plant groups to have emerged. The greatest number of primitive species resides in the Andean highlands of South America, where they originated in the Tepuis of the Guiana Shield approximately 100 million years ago. However, the family did not diverge into its extant subfamilies until 19 million years ago. The long period between the origin and diversification of bromeliads, during which no extant species evolved, suggests that there was much speciation and extinction during that time, which would explain the genetic distance of the *Bromeliaceae* from other families within the Poales\*. The most basal genus, *Brocchinia*, is endemic to the Guiana Shield and is placed as the sister group to the remaining genera in the family. The subfamilies *Navioideae* and *Lindmanioideae* are endemic to the Guiana Shield as well.

The West African species, *Pitcairnia feliciana*, is the only bromeliad not endemic to the Americas and is thought to have reached Africa via long-distance dispersal about 12 million years ago.

### Radiation of *Hechtia* and *Tillandsioideae*

The first groups to leave the Guiana Shield were the genus *Hechtia*, which spread to Central America via long-distance dispersal, and the subfamily *Tillandsioideae*, which spread gradually into northern South America. Both of these movements occurred approximately 15.4 million years ago. When it reached the Andes mountains, the speciation of *Tillandsioideae* occurred quite rapidly, largely due to the Andean uplift, which was also occurring rapidly from 14.2 to 8.7 million years ago. The uplift created a new mountainous environment for the epiphytic *Tillandsioides* to colonize, and greatly altered the region's geological and climatic conditions. These new conditions directly drove the speciation of the *Tillandsioides*, and also drove the speciation of their animal pollinators, such as hummingbirds.

### Evolution of the *Bromelioideae*

Around 5.5 million years ago, a clade of epiphytic *Bromelioids* arose in Serra do Mar, a lush mountainous region on the coast of South-eastern Brazil. This is thought to have been caused not only by the uplift of Serra do Mar itself at that time, but also because of the continued uplift of the distant Andes mountains, which impacted the circulation of air and created a cooler, wetter climate in Serra do Mar. These epiphytes thrived in this humid environment, since their trichomes rely on water in the air rather than from the ground like terrestrial plants. Many epiphytic bromeliads with the tank habit also speciated here.

Even before this, a few other bromeliads had already dispersed to the Brazilian Shield while the climate was still arid, likely through a gradual process of short-distance dispersal. These make up the terrestrial members of the *Bromelioideae*, which have highly xeromorphic characters.

### Adaptations

Bromeliads are able to live in a vast array of environmental conditions due to their many adaptations. Trichomes, in the form of scales or hairs, allow bromeliads to capture water in cloud forests and help to reflect sunlight in desert environments. Some bromeliads have also developed an adaptation known as the tank habit, which involves them forming a tightly bound structure with their leaves that helps to capture water and nutrients in the absence of a well-developed root system. Bromeliads also use crassulacean acid metabolism (CAM) photosynthesis to create sugars. This adaptation allows bromeliads in hot or dry climates to open their stomates at night rather than during the day, which reduces water loss.

Both CAM and epiphytism have evolved multiple times within the family, with some taxa even reverting to C3 photosynthesis as they radiated into less arid climates.

\*Poales—a large order of flowering plants which includes families of plants such as the grasses, rushes, sedges, etc.

## VALE - NEVILLE WOOD – April 18, 1940 - February 24, 2020

It was with the greatest sadness and shock that we learned of Nev's passing after his being diagnosed with a terminal cancer just weeks before. He was such a good friend to so many of us and such a valued member of our Society. At his funeral service I was reminded of another valued member of our Society some years ago—Dulcie Doonan, who we considered 'Our Dulcie' as she wore so many hats for the things she did and organized for us. And from the beautiful tributes paid to Neville at his funeral it seems that 'Our Nev' was also 'Our Nev' in so many other people's and organizations' lives.

Neville was born in Kiama Hospital in April 1940 and lived in Dunmore as a youth. He joined the Dunmore Bush Fire Brigade where he served for years and rose to Captain of the Brigade. He trained as an apprentice carpenter at BHP-AIS and after his apprenticeship he worked on sites with a builder and in Civil Defence.

After marrying Ailsa he moved to Shellharbour where he joined their Surf Club and also around this time he discovered an interest with First Aid and changed his career into the Ambulance Department back at the BHP Steelworks in 1969. Here he was an Ambulance Officer and a trainer of officers in First Aid. He took it upon himself to introduce efficiency procedures and was responsible for introducing the heart defibrillators into the steelworks (among the first to go into industry).

In his private life the hobbies he became involved in were growing orchids—here he grew them from seed—and carried out hybridization. He also had aviaries which involved collecting and breeding many types of birds. He was also an active member of the Light Rail Museum at Albion Park where he used his carpentry skills in rebuilding the old carriages.

He retired from the steelworks in 1999 and was pursuing these interests when in 2004 he joined our Bromeliad Society. He was an extremely active member, giving a lot of his time in giving presentations, writing articles for *Newslink* and he used his knowledge from his orchid days to carry on with seed raising and hybridization of bromeliads. Many of his plants he named and had registered—some were named in memory of some of our deceased members and other people whom he had admired, including *Billbergia* 'Our Rena' for dear Rena (Catherine Wainwright) and *Billbergia* 'Stephen Stone'

Neville was very proud when he was awarded Life Membership of our Society. He gave encouragement and was a great and loyal friend to all. In all his working life, as well as his private life, he gave his all and received many awards for his services. He will be sadly missed by all who knew him.

The above vale notice was prepared by Graham which included a list of all the awards which Neville had received over the years. These will be included in our Library copies of *Newslinks*.

But below are some memories from Sharyn Baraldi.

I've known Neville since he joined the Club in 2004. He's always been a person who was so approachable, whether to gain some information from or just to have a chat. With a smile on my face I will always remember early on when I was to drive Neville to the meetings and he would say, "Have we got time for a detour to the Queen Street bakery?", so as to get his two pasties. All the way to the meeting he would be devouring them and enjoying every mouthful. When we arrived and he got out, the car and he were covered from head to toe in crumbs. I treasured our talks to and from the meetings; I think we managed to solve the problems of the world!

Neville was a very generous person with his plants. I remember when someone's plant went missing and 'as quick as a flash' he was on the phone finding out the name of the plant and replacing it for them. That was the type of person Neville was.

I will miss him terribly and I know our club will be sadder without him. He's just up there potting up broms!