

Far North Coast Bromeliad Study Group N.S.W.

Study Group meets the third Thursday of each month

Next meeting October 18th 2018 at 11 a.m.

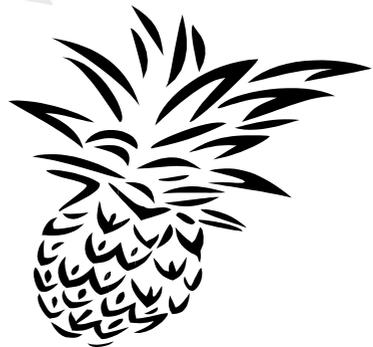
Venue: PineGrove Bromeliad Nursery
114 Pine Street Wardell 2477
Phone (02) 6683 4188

Discussion: September 2018
General Discussion

Editorial Team:

Ross Little
Helen Clewett
Les Higgins

pinegrovebromeliads@bigpond.com



Statements and opinions expressed in articles are those of the authors and are not necessarily endorsed by the Group.
Articles appearing in this News Letter may be used in other Publications provided that the source is credited.

Meeting 16th August 2018

The meeting was opened at approximately 11.00 am
The 11 members present were welcomed.
Six apologies were received.

General Business

Thank you to Gary and Coral for their donation of kitchen goods to the Group.

Attendance at the August meeting was disappointingly low. Marie's absence is due to a cancer removal operation. We all wish her an enduring recovery and hope that she is quickly able to rejoin us.

Concern was expressed about unfavorable Roundup® information. Opinions varied suggesting that some condemnations are excessive while others are "Anti-chemical" propaganda. The consensus of members is that when Roundup® is used assiduously it is a worthwhile total herbicide. When using chemicals of any kind always read the label and use 'chemical management best practices'.

A volunteer to record the minutes of the meeting is urgently required. It was frivolously suggested that Dave takes up the position of Minutes Secretary. The answer was an adamant no.

Chores for the Month

N.S.W is officially drought declared. For members that are privileged to be on town water supply it is prudent to wet the shade/glass house floor before mid-day. If tank water is all that is available adding extra shade could reduce water demand. Mulch garden beds to stabilize root temperature and moderate the demand for water.

New growth is emerging and now is the time to indulge in repotting. Modify good quality potting mix to meet the needs of specific plants. (see last month's Newsletter). Cam plant potting mixes should have lesser amounts of organics compared to non-cam. Due to the drought Kitty Litter (coarse grade Silica Gel) is being trialed as a water holding non-organic substitute for gravel. It holds its own weight in water but can the roots extract the water?

Beware, in drought conditions over-night temperatures can plummet and free water may instigate root-rot. Non-cam plants photosynthesize during daylight necessitating miserly watering in the early morning. Cam plants photosynthesize by chemical reduction during darkness. Fogging could be more advantageous than judicious evening watering.

Pritchards Mealy Bug (*Rhizoecus dlebianthi*) is to be expected infesting Tillandsioidese. A substantial colony can conceal itself between the leaf and stem. Whilst repotting remove the outside leaves to locate any infestation. Dunk infested bare rooted plants in Conguard® for a minimum twenty minutes. Incorporate Diatomaceous Earth (1 tablespoon/kg of mix) in the terrestrial substrate.

Pests are emerging from resting eggs. Attack them while they are active juveniles! One serious pest is the hard-scale known as Fly-speck-scale. Unable to produce honey dew all hard scales are ignored by ants. Without an anus the insects vomit excrement into the plant with disastrous results. The most opportune time to start eradication is the first month in spring.

Oil and emulsions as pesticides are obsolete recommendations that harm plants while never totally suffocate an insect population. Modern technique is to paralyze every insects nervous system by using Conguard® or an equivalent systemic chemical. Three sprays three weeks apart beginning before the end of September is a reasonable suggestion. Adult female scales cannot walk or fly. Once hard scale and resting eggs are eliminated re-infestation occurs by introducing an infested plant. Isolate and treat new plants before introducing them into your collection.

Start a nutrient program with emphasis on easing drought effects. Epiphyte nutrient should be more dilute than for terrestrials. Urea and Ammonium reduce a plant's carbohydrate creating greater vulnerability to heat or cold with amplified dependence on water. Nitrate will improve resistance to heat deaths. (Calcium nitrate, Magnesium nitrate, Potassium nitrate).

One suggestion for a spring nutrient is: Potassium nitrate + Calcium nitrate + trace elements/molasses. A few days later apply home-made Magnesium nitrate. This provides four of the major elements. Potassium sulphate is one provider of adequate sulphate and increases the health of the plant. Soft rock phosphate (mono-calcium-phosphate) included in the potting mix supplies Phosphate.

For growers that want to use a commercial nutrient read the declared guaranteed minimum analysis on the package. Select the nutrient high in Potassium and nitrate and as low as possible in Urea and Ammonium.

Sprinkle slow release nutrient prills over the surface of the new substrate. **Osmocote (18-5-11)** is a good choice to be applied frequently in small quantity. Resin coated prills have been known to split in high temperature. **Verde-cal-K plus** contains high levels of Sulphate and reasonable Calcium, these two elements are not adequately included in other commercial fertilizers.

Novice Popular Vote

1st	Coral McAteer	<i>Neoregelia</i> 'Coconut Ice Reverse'
2nd	-----	-----
3rd	-----	-----

Open Popular Vote

1st	Keryn Simpson	<i>Billbergia</i> 'Kolan Offspring'
2nd	John Crawford	<i>Guzmania</i> 'Sunnytime'
3rd	Dave Boudier	<i>Neoregelia</i> 'Kolan Tropics'

Tillandsioideae

1st	Keryn Simpson	<i>Tillandsia aeranthos</i>
2nd	John Crawford	<i>Tillandsia bulbosa</i>
3rd	Gary McAteer	<i>Tillandsia aeranthos</i>

Decorative

1st	John Crawford	'Waiting for the Rain'
-----	---------------	------------------------

Judges Choice

1st	John Crawford	'Waiting for the Rain'
-----	---------------	------------------------

Web Links for Checking Correct Identification and Spelling ?

Bromeliad Cultivar Register (BCR): <http://registry.bsi.org/>
Refer to this site for correct identification and spelling of your hybrid or cultivar.

New Bromeliad Taxon List : <http://botu07.bio.uu.nl/bcg/taxonList.php>
Refer to this site for latest species name changes and correct spelling.

Bromeliads in Australia (BinA) <http://bromeliad.org.au/>
Refer to this site for its Photo Index, Club Newsletters, Detective Derek Articles.

Keep these web sites set as desktop icons for quick reference access.

Where do I Find the Dates ?

www.bromeliad.org.au then click "Diary".
Check this site for regular updates of times, dates and addresses of meetings and shows in your area and around the country.

Show, Tell and Ask!

Ted asked how to tackle sooty mould. Soapy water was immediately suggested for eliminating sooty mould. This recommendation, although correct, treats the symptom not the problem! Sooty mould indicates soft scale or aphid infestation. Both insects are described as having piercing and sucking mouthparts although neither can suck. They pierce the plant's sieve tubes and plant pressure thrusts sap into the feeding insect. "Honey dew" dribbles out of the soft scale's anus and the aphid's two "pressure release horns". This excrement is nutrition for sooty mould and ants which can be seen with sooty mould, they nurture, protect and distribute both soft scales and aphids. To thwart ants gaining access to pot plants add Diatomaceous Earth to the substrate. Elsewhere kill / treat undesirable insects with Conguard®. Only when all "piercing and sucking" insects are annihilated and no ant able to access plants can soapy water lastingly clean away sooty mould.

Ross displayed a globular inflorescence of an *Aechmea* and asked members to identify it. Guesses were 'Blue Cone', however the correct name is 'Pom Pom'. Members who own plants tagged as *Aechmea* 'Blue Cone' are advised to look at the inflorescence shape, if it's globular – a little round ball of blue petals on a stick - it is most likely to be *Ae.* 'Pom Pom'. If the inflorescence is cone shaped or - longer than it is round and tapered, look toward *Ae.* 'Blue Cone'. One must also consider *Aechmea cylindrata* for the later which has as the name suggests a cylindrical inflorescence more so than being conical (cone shaped).



Aechmea 'Pom Pom'



Aechmea 'Blue Cone'



Aechmea cylindrata

photos from: The Butcher Files

Ross gave a demonstration of plant propagation. After removing the skirt of dead leaves from *Goudaea* 'Grubby Tiger' it was beheaded to make two plants. A clever technique of tearing plants apart between the old and new growth of another *Goudaea* displayed how roots can be retained on the new growth. *Goudaea* 'Grubby Tiger' unreg. is a hybrid of *Goudaea ospinae* var. *gruberi* x *Goudaea* 'Tiger Tim' giving rise to a grex of mixed colour patterns of browns, yellows, greenish's and white siblings and various shades of colour in between, bred and named by Ross.

Trish delighted us with photos of fabulous plants growing in her garden. Trish moved to her new home around 3 years ago, it had some established eucalypts, red ash, wattles and more with few under plantings. She set about placing rocks along the edges of the gardens she had designed for her Bromeliad plantings. An eroded rock faced creek gave some inspiration to what is now an amazing accomplishment. Well done Trish and congratulations on your efforts.

John showed several pink Neoregelia. Each is an attractive plant, however, the similarity between some made it difficult to justify individual names.



Neo. 'Sexy Pink' Neo. 'Tinkerbelle' Neo. 'Pretty Pink'
 Neo. 'Pink Sensation' Neo. 'Dreamsickle' Neo. 'Pink Fairy Floss'

It is always a pleasure to have a new Bromeliad species introduced to our Group. This month we were shown a *Sincoraea* in flower that raised a few eyebrows and heart beats, there were many "I want" murmurs also.

The following information was given about it: "This is an undescribed species of *Sincoraea* which grows near Andaraí in the state of Bahia.



Sincoraea sp. Andaraí photo by Ross Little

It is the species which is mentioned in the protologue for *Orthophytum* (now *Sincoraea*) *heleniceae*, as being found by H. and O. Ribeiro near the site where they discovered *Sinc. heleniceae*. It is similar to *Sinc. mucugensis*, except that it has much more densely lepidote leaves which are usually longer and have thinner texture.

The habitat is probably limited to an area of 100 kms. It grows on rocks and rocky outcrops in shady areas near waterfalls. In cultivation it is under 70% white shade cloth and watered once a week during winter".

Lepidote - Surfaced with small scurfy scales (trichomes), a key character of the family Bromeliaceae. (from: A Bromeliad Glossary, The Bromeliad Society, Inc.)

To Pup It or Flower It ?

Some Bromeliad lovers enjoy the beauty of the inflorescence/flowers which is what caught their eye and fascination of these wonderful plants and always will, so let it flower. Other growers have gone past this stage and just want as many plants as they can get regardless of space getting very creative along the way. When all horizontal space is taken up they go vertical using trees as many of our plants are epiphytic, walls as vertical gardens, hanging baskets and many other vacant spaces including roof tops. To develop an inflorescence a huge energy drain is placed on the plant, some growers prefer this energy to be directed toward pup growth, so they cut the inflorescence off at an early development stage to get more pups. I'm back to the flowers stage and enjoying their beauty.



Billbergia 'Kolan Offspring'
1st Open Keryn Simpson



Neoregelia 'Coconut Ice Reverse'
1st Novice Coral McAteer



Guzmania 'Sunnytime'
shown by John Crawford



Tillandsia aeranthis
shown by Gary McAteer



Tillandsia aeranthis
1st Tillandsioideae Keryn Simpson



Neoregelia 'Kolan Tropics'
grown by Dave Boudier



'Waiting for the Rain'
1st Decorative and Judges Choice
John Crawford



'Two is Company, 3 is a Crowd'
by Keryn Simpson



Tillandsia 'Cotton Candy'
by Dave Boudier



'Blooming Bills'
shown by Dave Boudier

A Little Bromeliad History - Part 2

sourced by Helen Clewett

Back to Curtis's Botanical Magazine now. From 1857 is the plate of the newly described *Puya virescens* Hooker. A specimen came from a Belgian garden tagged as a *Puya* sp. and William Hooker left it in that genus, much later it was transferred to *Guzmania*. It is an epiphytic bromeliad endemic to the central coast of Venezuela.



Puya virescens



Aechmea lavandulacea

Still later in time, in 1905, we arrive at the illustration of *Aechmea lavandulacea* C. H. Wright. It was made after a plant found on Grenada, one of the Windward Islands in the Caribbean. A citation from the description: "The species is very distinct and is characterized by the distichous arrangement of the panicle-branches and flowers. The broad lavender-coloured margins of the bracteoles, resembling in colour the flowers of some species of *Statice*, candied all over with white scurf, harmonize with the deep violet petals, and thus avoid that sharp contrast in colour so often found in the inflorescence of plants of this order". The differences

are given between this species and *A. pubescens*, *A. lingulata* and *A. dichlamydea*. However in 1896 Carl Mez had described a similar plant under the name *Aechmea smithiorum* and *A. lavandulacea* is now treated as a synonym of that one. There has been an article on *A. smithiorum* discussing its misidentification in the past in the BSI Journal (Luther 1995).

From 1910 is the plate of *Neoglaziovia concolor* C. H. Wright, also newly described. It looks very much like *Neoglaziovia variegata*, see the article about that species in the BSI Journal (de Paula and Guarçoni 2007). The text with the plate reads: "The bromeliad here figured is a native of the northern portion of the State of Bahia in Brazil, where it is known as the Makimbeira; *Dyckia glaziovii* but treated by Mez, perhaps



Neoglaziovia concolor

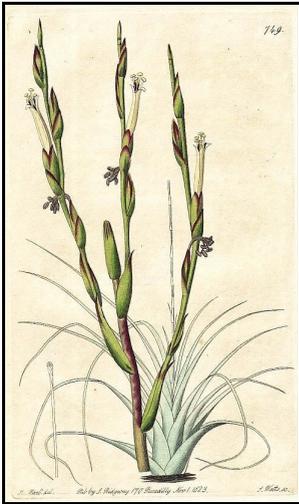
here it grows in association with the Caroá, a very nearly allied plant referred by Baker as *Dyckia glaziovii* but treated by Mez, perhaps more satisfactorily, as a member of a distinct genus *Neoglaziovia*. From the Caroá (*N. variegata*) the Makimbeira (*N. concolor*) differs in its shorter stature and in having its leaves uniformly white-lepidote, the younger parts are indeed almost woolly; the leaves of *N. variegata* are glabrous or only very minutely lepidote, and when fresh are conspicuously marked with lighter transverse bars which in dried specimens become obscure or disappear entirely. The leaves of both species furnish fibre; that of the Caroá is well known and comes chiefly from the Queimadas District: it is made into ropes for binding packages of tobacco. These ropes have a breaking strain of 3 tons to the square inch; they are, however, very sensitive to attack by alkalis. The fiber of the Makimbeira is less well known and is of a softer and poorer quality". The plant flowered at Kew in 1909 after six years, it was slow growing. Many plates from Curtis's Botanical magazine were used for the illustrations in **A monograph of the Trochilidae, or family of humming-birds**, often with some adaptations. This work on birds was written by **John Gould** with drawings by Gould and lithography by H.C. Richter, published in 5 volumes from 1849-1861 with a supplement in 1887 by R. Bowdler Sharpe. Below are some examples. from Curtis's Botanical magazine were used for the illustrations in **A monograph of the Trochilidae, or family of humming-birds**, often with some adaptations. This work on birds was written by **John Gould** with drawings by Gould and lithography by H.C. Richter, published in 5 volumes from 1849-1861 with a supplement in 1887 by R. Bowdler Sharpe. Below are some examples.

Several other magazines and works published in the form of a series followed in the wake of Curtis's Botanical Magazine. In 1815 **Sydenham Edwards** started **The Botanical Register**. The text on the title-page of the first volume reads that it "consisted of coloured figures of exotic plants cultivated in British gardens, with their history and mode of treatment". Initially the text was by John Ker-Gawler, later by John Lindley. For the volumes 15-33 the magazine was titled **Edwards's Botanical Register**. Edwards made many drawings for the coloured copper engravings in the first 15 volumes but he was not an engraver himself. Drawing the illustration and making the actual print (via engraving or lithography) was often done by different persons. When publication of Edwards's Botanical Register ceased in 1847, a total of



Billbergia iridifolia

2702 plates had been published, including 20 bromeliads. An important article in The Botanical Register is the one connected to plate 1068 of *Billbergia iridifolia* in volume 13. John Lindley - the first professor of botany at University College London in 1829 and Britain's pioneer orchidologist - gives here a synopsis of the bromeliad genera known at the time: Aechmea, Ananas, Billbergia, Bonapartea, Bromelia, Caraguata, Guzmania, Pitcairnia, Pourretia and Tillandsia.



Tillandsia flexuosa

The bromeliads formed in his words "a family of plants interesting from their beauty or singularity but of which the systematic arrangement has not been carefully studied". *Billbergia iridifolia* originating from Brazil was described several years earlier in the genus Bromelia. The specimen used to make the drawing was sent from Rio de Janeiro by William Harrison. The next illustration that I selected from this publication depicts a plant provisionally described as a pale-flowered variety (*y. pallida*) of *Tillandsia flexuosa* Swartz. Lindley writes that "*Tillandsia flexuosa* must either be a very variable plant, or more species than one are already included in it by those who have described the wild subject". He didn't see the flowering plant after which the drawing was made himself, but judged that in foliage and form of parts

it resembled the specimens in the Banksian Herbarium. We now know this plant under the name of *Tillandsia utriculata*, the description by Linnaeus dates from 1753. This epiphyte has a distribution from the south of the United States to Venezuela. One more new species described by Lindley was *Puya heterophylla*. Later this species was classified in the genus Pitcairnia by Austrian botanist Johann Beer. The plant was imported from Mexico in 1838 and was found "most remarkable as bearing two different kinds of leaves, short brown spiny and long green lanceolate". It was after this characteristic feature called "heterophylly", later encountered in other Pitcairnias too, that the species was named. The plant is epiphytic in moist forests but also saxicolous on dry cliffs and is very widespread, ranging from Mexico to Peru.

Taken from: www.bromtravels.nl/ht/iconcontext2.html



Pitcairnia heterophylla
published as
Puya heterophylla

Great Britain

BROMELIADS and MOSQUITOS

by Rob Smythe M.Sc.

A bit of history as to why I am doing this research. The Townsville City Council in Queensland has been prosecuting people for having mosquitos in their bromeliads. They have advertised these plants as the arch enemy. I contacted the World Health Authority asking for any research where *Aedes aegypti*, the mosquito carrying Dengue Fever has been found breeding in bromeliads. The latter are of no concern to them so far as Dengue Fever is concerned as only two cases of finding larvae in bromeliads have ever been reported and the number of wrigglers was negligible. The Council (Health Department) is saying bromeliads are bad in the tropics while I am saying that we in the dry tropics, like Hawaii, have the best growing and colouring up conditions in the world. Bromeliads should be promoted as a tourist attraction here in the tropics. Somewhere between the two is probably correct. The Townsville City Council (Parks and Gardens) is helping me resolve this dichotomy by supplying me with some of their larger bromeliads to add to my study so that I would have a larger range of genera and species than I had in my pilot study. While I was waiting for new growth of pest free plants, and waiting for the vases to become large enough to possibly attract mosquitos I made a strange observation. The council supplied plants were getting mosquitos in some of their plants while my plants weren't. How could this be? Was someone trying to show me that we were both right? I had proposed in my previous publication that I believed there could be a chemical inhibitor to mosquitos released by bromeliads. My wild unspoiled plants up the trees never had mosquitos in them in 30 years so my hypothesis sounded reasonable. After all some carnivorous bromeliads are known, so we know they can utilise flesh. If this is true why were the council ones performing differently?

My son, Dr. Mark Smythe working at University of Queensland read and forwarded to me an article found in their newsletter stating that a predator of mosquitos called Mesocyclops had been found by a Dr. Michael Brown working at the Queensland Institute of Medical Research. My garden has been pesticide free for thirty years while council plants would have been sprayed. Could the council have killed a predator?

Now that I have started asking questions I feel that I can explain my findings better in a Question and Answer format.

Predators, that is my favourite word at the moment. I have spent a lot of time studying the water in vases of bromeliads, and so far have found several predators worthy of my research. As I am now retired, I do not have the funds to exactly identify these so accept my names with some reservation, that is until someone gets paid to research them properly.

What are Mesocyclops?

Mesocyclops are found in the bromeliads with clearer water. These have only recently been discovered as a mosquito predator by Dr. Michael Brown working at the Queensland Institute of Medical Research. They are very small and just visible to the naked eye. They zig and zag about often carrying two large egg sacks. Several researchers are using these creatures to study mosquito breeding in mine shafts and water tanks. These fellows keep my bromeliads free of mosquitos right through the year up until the heat and heavy rains of summer. They are now gone, dead or washed out of my bromeliads. They do not like putrid conditions and do best in clearer waters in cooler conditions, however they can be replaced after the heat of summer. (Uncle Derek says they look like very miniature Mitsubishi logos if you clean your bifocals)

Where can I get the predators?

Up here in Townsville one looks for a pond that has no fish or tadpoles and as yet no wrigglers. It (the pond) is under predator control if it has not been sprayed. I brought the water home from two ponds and set up my own tubs in the yard. I have never had to top it up, but I do watch that my ponds do not get too hot or polluted. Midges have come to the ponds of their own accord and can be found in most neglected collections up here.

Are there any other predators?

Blood worms, these little creatures are small red aquatic worms which multiply via some weird divisionary process. They hatch into non-biting midges. These appear to be predators only in the sense that they can kill wrigglers, I have never seen them eat the wrigglers, though some midges can be carnivorous. While I was ill I set up glasses of possible predators around the bed, I had time to observe these creatures. Using wine glasses to simulate bromeliads, wrigglers came down to the bottom where the worms were concentrated. Anything touching the worm was wrapped in a ball of worm. These worms do not hunt. I found them in old neglected billbergias on the trees, they concentrate at the bottom of the vase, they are unusual creatures in that they can survive in putrid conditions. Their red colour is due to their possessing haemoglobin like ours. This concentrates the oxygen in their bodies, and is apparently very rare in insects.

Spirogyra: this is a filamentous algae found in ponds. When healthy, this collects bubbles and floats to the surface of the bromeliads and eventually becomes impenetrable to the wriggler, which subsequently drowns. Unfortunately, it can hook on to the spines and be carried out of the water. It then bleaches and looks ugly so you must be prepared to push it back into the water.

Bladder-worts: I have read about these as being mosquito traps in wild bromeliads (in habitat). The first one appeared in my *Neoregelia burle-marxii*. Maybe it was imported with the plant? When the plant was small, mosquitos appeared, I guess it was trapping and eating my Mesocyclops. Now the plant is larger mosquitos are not present. It may be useful, it's early days yet.

How do I treat my bromeliads to minimise mosquitos?

For the dry season and incidentally the cooler season, they are totally under predator control. I rarely find a single mosquito during this period. Spirogyra is best, Mesocyclops are very efficient but so small you do not know they have died until you find mosquitos.

Do you recommend any particular spray treatment?

For the wet season I spray once a week. I have written of my aversion to insecticide sprays in the environment, the spray I use is my own formula, it does not contain harmful insecticides. I mix together 50m1 Alginox, 50m1 vinegar and 100ml of kerosene shaken to make an emulsion and made up to 5 litres with water. The kerosene is used only at swarming times. I walk around and spray the plants at dusk - 5 litres covers a thousand plants. If I have too much on the leaves of delicate plants I water these plants half an hour later, time enough for wrigglers to go beyond the point of no return on the health charts. This dilute emulsified kerosene, presumably because of the oil in water emulsion formed, does not appear to damage the plants like kerosene or kerosene based sprays do. Do not be tempted to try commercial white oil. Kerosene has a low boiling point and hence higher vapour pressure and does not hang around like the damaging white oil.

If I add kerosene to the spray, how long should I leave it on delicate plants?

If you have delicate plants with soft new leaf, wash off 15 minutes after spraying. My studies have shown that large wrigglers die quickly but minute ones can survive 15 minutes under the spray in well-oxygenated water. Probably something to do with thinner skin and larger surface area to body weight of the smaller wrigglers.

How does the spray work?

The kerosene stays only long enough to smother the wrigglers. The Alginox is surfactant, which would lyse and destroy eggs. It would also change the surface tension of the water which might cause landing mosquitos to get wet and sink, and also make it impossible for hatching mosquitos to escape from the surface. The vinegar changes the pH of the vase water killing the larvae.

What is the easiest way to check for mosquitos?

Tip the water into a white bucket is the surest method, a white bucket will show the smallest wriggler. Should this method be impossible or even impracticable then try the battery acid tester to sample the water. Check for surfacing wrigglers looking for air after the spray treatment. Use a torch at night. All these methods will work for you.

When/where am I most likely to find mosquitos in my bromeliads?

Flowering neoregelias, these have rotting flowers in the vase supplying food for the predators as well as the mosquitos, and they release carbon dioxide as the old flower ferments. Mosquitos are attracted to water, flesh tones, heat, and carbon dioxide. Flowered neoregelias score 3 out of 4. Shaded plants also attract mosquitos. Very rarely do I see a mosquito hatching of any size - the worst offenders in my collection are neoregelias, frequently offending, but not big hatchings unless their water is putrid. Screwing out the spent flower removes the food source and also cleans up the plant's vase.

What else can I do?

When you are sitting in your garden amongst your broms having a coffee and a cigarette just drop your coffee swill and your butts into the broms. The caffeine and nicotine will kill just about everything in the animal kingdom including your pet dog!

Before signing off I should point out two things. I will probably change the recommended amounts in sprays in the future as experiments need a lot of time and patience. I wish to get the Alginox as low as possible as it could harm frogs and it wipes out the desirable algae and spirogyra. The spray does not seem to worry the midges and I do not yet know what it does to the Mesocyclops.

The second thing is probably obvious now, and that is, the predator method and the spray method cannot be carried out concurrently. The spray kills the algae spirogyra.

In conclusion, if you use insecticide, observe closely as in some areas of the world there are mosquitos now immune to all known insecticides. It is happening here to a degree. If I am right, the next step would be to develop chemical resistant organisms and then use integrated pest management.

Eds: with mozzie season almost upon us, our beloved Bromeliads will again be falsely accused of being the breeding ponds for the dreaded mozzie, we hope this article by Rob Smythe M.Sc. helps dispel this myth for our readers.