



THE MONTHLY BULLETIN OF THE KU-RING-GAI ORCHID SOCIETY INC.

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Annual Membership : **\$15 single, \$18 family**

Patrons - Pauline and Trevor Onslow

President : Dennys Angove (Culture Class) 043 88 77 689
Secretary : Jenny Richardson
Treasurer : Lina Huang (and Sales Table)
Vice President : tba
Editor (Hon. volunteer) Jim Brydie
Society mail to - PO box 1501 Lane Cove, NSW, 1595

Committee Jessie Koh (Membership Secretary / Social Events)
Committee Herb Schoch (Community outreach, Sales Table)
Committee : Chris Wilson (Library and Reference Sources)
Committee : Bill Saunderson (Sales Table)
Committee : Di Flinders
web site (active link) : <http://kuringaiorchidsociety.org.au>
Society email : kuringaiorchidsociety@gmail.com

Next Meeting : Mon 17th April 2023

Venue : *The West Lindfield Community Hall, corner of Bradfield Rd and Moore Avenue, West Lindfield.*

Attendees must be at least double vaccinated. Please tick your name off the attendance list on arrival & enter 'DV' for double vaccinated if your status has not already been recorded. Face Masks recommended.

The hall is open from 6.30pm to set up the hall (please help), benching can begin from 7 pm but **PLEASE** no benching until all the class dividers and cards are in place. Give the set up team time to get everything organized.

Our Culture class for March will be Trevor Onslow talking about ***Using Fertilisers with Orchids***. We won't be setting up the culture class room with chairs from now on so if you attend, please bring in a chair from the back of the main hall. If you need help, just ask.

The usual **monthly raffle**, and the **library** will be operating, and the **sales table** will be open for sale of members spare plants and for small quantities of pots and other growing supplies. PLEASE though, anyone expecting to purchase a larger volume of any one item should contact Dennys Angove in advance as previously explained.

The Supper Break – Our supper Volunteers for April are **Carol Blackwell & Bronwyn Yager**. Thank you for volunteering girls. It makes everything go much more smoothly. Members please note - the society supplies tea, coffee, milk, sugar etc, **but we ask all members to bring in a contribution of cake or biscuits etc for the supper table, AND please bring your own mug.** Also note that Supper is not self-serve, a member will be assigned to serve to minimise handling. For those who forget to bring their own mug, we have a few disposable cups but why not put a spare set of mugs in your car right now, as soon as you get this bulletin.

After the break, our Guest Speaker will be Garrie Bromley who will run an Advanced culture class on Controlling pests. Garrie has been successfully managing the insect pests in his collection for a long time and has been doing it very responsibly. You should come along and hear what he has to say this month.

Best of the Evening Hybrid – Den. Enobi Purple ‘Splash’ - grown by Trevor and Pauline Onslow



No matter how many times this orchid wins Best of the Evening you still have to stand before it in awe when you see it. I won't show you the full plant picture so you will have to take my word when I tell you the canes are only about 30 - 40 cm tall and each cane carries multiple spikes of a dozen or so of these spectacular flowers.

I have never been greatly successful with these 'hardcane' hybrids but I am happy to admire them when growers like Trevor or Garrie bring them in.

If you want to know the amazing back story to this particular classy orchid, you can find it in the May 2019 bulletin, and if you can't find that, you can ask Jenny or myself and we will send you a copy.

Congratulations Trevor and Pauline. It is a magnificent orchid and you grow it to perfection. It isn't one for the beginners but when a grower gets to that point they are ready to take on hardcanes I am sure you will be the one to do the teaching.

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Society News (if anyone has a news item, please phone Jim on 9476 3383, or email at jimbrydie@aussiebroadband.com.au)

President Dennys' Desk – Our March meeting was attended by 42 people and 95 plants were benched. This was a great result given that some of our “big” benchers were on the apology list. The flowers were wonderful and seem to be very special in as much, I can't grow many of them. I also had a fun time giving the talk about orchid finds while Janine and I were on holidays in WA. Thank you for the great feedback.

A Big Thank You: After some deep investigation and sorting of technical advice, I was able to purchase our new projector with the grant funds given to us by the Ku-ring-gai Council. The projector worked above expectations. On behalf of our society, I extend our profound thanks to the Ku-ring-gai Council for the benefit they have bestowed on our society. The projector is available to all our members who wish to use it within the society and/or to those members who would like to use it elsewhere for the benefit of our society, with appropriate acknowledgement of our Council's support.

Supper Machinations – So, our supper is off to a good start. Our society does not normally provide the food for supper. There are two distinct roles that members can assist with when it comes to supper. **Firstly**, members are invited to bring in an offering for the supper table. It is not mandatory, but if able, please do so. Also, please remember you are not feeding everyone. Food offerings should be initially placed in the kitchen. If you have special food requirements (e.g. gluten free) then please bring in an offering with that need. **Secondly**, we need two volunteers each meeting night to set out the food brought in by members. Di Flinders is the keeper of the volunteers list. It is not gender specific, please see Di so you can put your name down if you would like to help. In order to minimise plastic use, please bring in your own cups since we are not replacing disposable plastic cups and such.

Sales Table – So, we are having a lot of excitement around our sales table early in the night as members' plants come in for sale, which is fantastic. However, please remember that the sales table does not open until 7.00 pm since it takes some real time to get items sorted let alone the minds of Bill and Herb. Please let the plants arrive at the table. By all means, request a reservation for a plant but remember courtesy reaps rewards in the long run.

Culture session chairs – The culture lessons are underway. I request that if you are attending a culture class, to please carry a chair into the annex to attend the class and then take it back out again. If you are unable to carry a chair, please ask someone for help. I am always happy to do this for you. Thank you, Chris Wilson, for the last class, it was really well received.

GCP purchase – *Note that the supplies purchase has been made.*

Bulk purchase – If you need large numbers of items that we normally stock, please email your requirements to me so I can bring them in as a special order. I only have limited space in my vehicle so therefore, I am limited in the numbers of items I can bring to our meetings.

Wearing masks – Although COVID Safe rules have changed, the wearing of masks in indoor spaces is still recommended. If you are unsure about this, please visit, <https://www.nsw.gov.au/covid-19/stay-safe/guidance-on-wearing-face-masks>. If you are still concerned about the transmission of COVID or flu, then please feel free to continue to wear a mask at our meetings. I will continue to wear a mask until I feel it is safe not to.

Member's welfare – personal challenges occur all the time, so please remember, if you need to speak to someone immediately then you are most welcome to contact me at any time, 24/7 on 043 88 77 689.

Other News Items

1. New Members – Welcome aboard to Joy Gouvoussis & Peter Serb as new members. I know that Joy is member at the Species OS and is a keen grower. I hope they both find many new friends at our club. Please find them at a meeting and say hello. And also welcome back to Mary Matthews after a little stint away from us. I know Mary from the tropical Plant society where we are fellow members and her garden and her plants were featured in their magazine this month. She is a very accomplished grower and plant lover.

2. Future events

Sat 15, Sun 16 April – 9am – 4pm both days - Collectors' Plant Fair, Hawkesbury Race Club, 1 Racecourse Rd, Clarendon – see www.collectorsplantfair.com.au - Hundreds of vendor stalls. Fantastic plants including orchids. All of Sydney and surrounds plant lovers flock there every year. If you haven't been before, why not check it out.

Sun 16 April - MWOS Orchid Auction, Cromer community Centre, catalogue available. Hundreds of orchids sold by public auction.

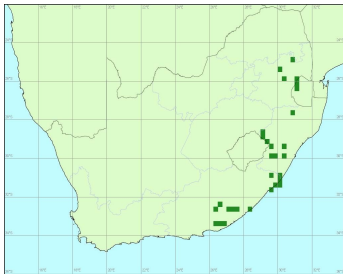
Fri 26 – Sun 28 May - Orchids Out West, Many club displays, many orchid vendors in the vendors hall. held at Hawkesbury Showground - note new venue

Sat 24th – Sun 25th June – Mingara Orchid Club Fair and Show at Tumby Umbi in Mingara Sports club

Humour – I was visiting my daughter the other day when I asked if she had today's newspaper I could borrow. She said “this is the 21st Century and we don't waste paper on newspapers. Here use my ipad.”

I can tell you this, that fly never knew what hit him.

Best of the Evening Novice – *Stenoglottis longifolia* grown by Loretta & Paul Au



This one of my favourite orchids. It comes from the east coast of South Africa, along the coastal areas of Natal and Swaziland. It grows as a quasi terrestrial in humus or on mossy rocks and rock outcroppings, at elevations of 300 to 1300 metres.

The latitude of these areas is about the equivalent in east coast Australia, of Sydney to Brisbane, so this is a relatively mild temperate zone, and certainly not tropical. Natural habitats up to 1300m in this zone means these are quite cold tolerant orchids in our Sydney climate.

Stenoglottis longifolia has fairly soft textured leaves in a rosette

Stenoglottis longifolia
Foto e cultivo: Flavia Simões



format at ground level. On average the leaves are about 20cm long and 2cm wide and have pale purple spotting along the leaf. More on some plants than others, to the extent that some can be almost plain green. The leaves are slightly fleshy, and have a more or less undulate (wavy) edge. Multiple, erect, 35cm flower spikes occur in Autumn, each carrying about 40 cute lilac/pink flowers with purple spots. The flowers are about 2cm long.

Like most orchids, these are seasonal growers. They are basically deciduous, although in mild conditions they may not lose all their leaves before they begin to sprout a set of new fresh leaves each spring. A mature pot will eventually fill with clusters of fleshy tubers that are easily divided when repotting but are best left in decent size clusters.

They flower every year without fail provided they are treated with half decent respect. Grow them with water and fertilizer when they shoot and want to be grown, back off and let them rest when the colder weather sends them into semi dormancy. Repot every few years and pass a few tubers on to your friends with instructions of how to grow.

In nature, it grows as more or less a terrestrial, but not usually a soil grower. It occurs in humus or in moss on rocks.



the 1st 3 pictures above show *longifolia* growing in mosses on rock surfaces but the 4th picture shows that it does also grow in humus/soil

As you can see from above, *Sten. longifolia* grows in relatively good light. It may even receive direct sun for short periods during the day but most of the time it would be in scattered bright shade. I have seen pictures of it grown as a garden plant in raised beds (see right), but I am guessing that these would have been in European or North American locations where the sun is at a lower angle and less severe. In Sydney it certainly grows very well under 50% shade cloth but it would also likely grow well in a garden situation where the soil was well drained and broken sun was as much as it got.

In pot culture it prefers something like the kind of semi-terrestrial bark mixes that many Paphs require. That is, an open mix, but one with enough finer components to hold moisture for a little longer.

The first pot full I ever bought was potted in a mix of huge chopped up lumps of an old foam box mixed with shreds of sphagnum moss. It was about 70% foam, 30% sphag. When I had to repot it, I couldn't reproduce that odd but very successful mix, so I converted it to a



finer bark mix with some added perlite and coco fibre chunks, and a fair proportion of crumbled styrene foam. I have since tried a range of semi terrestrial mixes, including peat and perlite, and they all worked ok. Just some a little better than others, but this isn't an orchid that is all that touchy.

Some books advise that "they should be disturbed as infrequently as possible", but as with most orchids, *Stenoglottis* are intolerant of sour conditions around the roots so you shouldn't take the undisturbed principal too literally. They should be repotted if the medium becomes stale and repotting is best done when the plant is dormant."

Congratulations yet again Loretta and Paul. Very good growing as usual.

Best of Evening Species – *Gomesa crispa* (or *recurva*?) - grown by *Lisa Harris*



Now that is a really nice specimen of a very pretty orchid.

Did you know that once upon a time I was convinced there were just two little *Gomesa* species in the world? And what's more, they looked very much alike as well. They were *Gomesa crispa* and *Gomesa recurva*, and although they were relatives of their more famous cousins the *Oncidiums*, they didn't really look much like other *Oncidiums* and there was no trouble at all telling a *Gomesa* from an *Oncidium*.

It turns out I wasn't quite right of course. There were a few other *Gomesas* that look like *Gomesas* but they are rarely seen in collections and I suspect that is because *crispa* and *recurva* are the two most attractive ones and



the easiest to grow.

Gom. recurva and *crispa* look much the same. They both have 25 mm green flowers that look a bit like a little man with his arms in the air. The key distinction between them is that the sepals and petals of *crispa* have markedly wavy edges and *recurva* doesn't and that the two lower sepals (ventral sepals) of *recurva* are fused together along most of their length and in *crispa* they are only fused at the base ends near the column.

When you look carefully at these close ups, I think Lisa's plant (left) is *Gomesa recurva*. (*crispa* is on the right)

In a 2007 article by Francisco Miranda on the American Orchid Society website, he says : "***Gomesa*** is a Brazilian tropical genus that was described by Robert Brown (1815) and named after Dr. Bernardino Antonio Gomes, a Portuguese physician and botanist. There may be several more species than the dozen currently recognized, but these names so far have not been clarified. These plants grow in mountainous coastal tropical rain forest at altitudes from 450 to 1,300 m, in the states of Rio Grande do Sul, to Espírito Santo. A few species find their way a bit more into the interior but always in humid forests around rivers. In the natural habitat, plants are epiphytic or lithophytic, usually with a lot of organic material trapped on the sheaths of the pseudobulbs. Plants of ***Gomesa*** produce fairly well-developed pseudobulbs, and the whole plants are more of a light dull green color than typical *Oncidium* types. Inflorescences are arched and produce numerous small (to 25 mm) flowers where the dorsal sepal and petals stand up and lateral sepals point down, producing very peculiarly shaped flowers. Flowers are uniformly greenish-yellow to green, regardless of the species so it is sometimes quite difficult to set them apart. The flowers are usually strongly fragrant. The most common species in cultivation are ***Gomesa recurva*** and ***G. crispa***, although a few others sometimes find their way into cultivation." [No. of species: The World Monocot Checklist currently recognizes 13 species.]

And in case you were wondering, the genus name is pronounced as though the "s" was a "z".



G. handroi



G. alpina



G. glaziovii



G. messmeriana

But, in 2015 along came the scientific review of Orchidaceae that we expected but feared. In a paper titled "**An updated classification of Orchidaceae**" by MARK W. CHASE, KENNETH M. CAMERON, JOHN V. FREUDENSTEIN, ALEC M. PRIDGEON, GERADO SALAZAR, CÁSSIO VAN DEN BERG and ANDRÉ SCHUITEMAN, many changes were proposed to which species belonged to which genera and therefore to various name changes that followed from that.

The changes we need to consider here are the ones affecting *Gomesa* and a group of some of the most attractive

(previously) *Oncidium*s, that came mostly from Brazil, and that were now determined to be in the genus *Gomesa*.

When orchid taxonomy began in the 1700's it was based on common physical characteristics, mainly around the features of the flower involved in pollination and reproduction. The idea was that a species was distinct from other species because it bred (nearly always) within its own population and not with other species. Natural hybrids do exist in nature but they are often sterile or at least do not stabilize and reproduce as a new species of their own.

The more modern approach to taxonomy is to analyse the DNA of related species to understand where the DNA changed. That can give us a backward view of progression from genus to genus and within a genus from species to species. If all the species and genera that have ever existed still existed, we should be able to determine whether the chicken or the egg came first and exactly which species came from which species etc. Unfortunately, most species that have existed, have disappeared as part of the evolutionary process, so interpreting DNA changes can't be as exact a science as it might have been.

We all know how evolution works. That is, it is built upon small changes upon changes upon changes as some perhaps slightly different individual of a species suddenly finds it easier or more beneficial to grow where its brothers and sisters don't or can't grow, or it attracts some new pollinator to help carry out the sex part for them, or some other way that they become distinguishable from their brothers and sisters. Perhaps it had a different shape or smell or some other physical characteristic, or perhaps it could now survive in conditions its siblings could not.

If this new individual type takes hold and established a population of children with whatever its 'different' characteristic was, and that population stabilizes, then perhaps we have a new species. However, to establish a new genus requires an even wider population of such changed characteristics, such that the new species or perhaps even more than one species, no longer meet the definition that defined the previous genus from which it came.

So how do we assess DNA based decisions about species and genera relationships versus physical changes? Well there is the problem.

Francisco Miranda tells us above that in 2007 there were 11 recognised *Gomesa* species and you can see from the example photos I inserted just below his description, that these are all recognizably 'Gomesa-like'.

But now science now tells us that, another much different looking group are also *Gomesa* and must be added in. I know that there can be large physical variability between species in a genus but when you have a subset with one

common set of characteristics and another subset with a different set of characteristics the sets are usually at least identified as definable sections of the genus. I always understood this to mean a section was a potential side branch that might eventually separate and become a genus of its own. If there are intergrades between two sections, that is some species within each section still retain clear characteristic of the other set, then the sections are not



Onc/Gom. gardneri



marshallianum



forbesii

sufficiently separate to become a new genus. Maybe that is where the enlarged *Gomesa* genus resides at present?

I am not within a bulls roar of being qualified to debate the science of the new *Gomesas*. I believe the taxonomists are right about the separation of the Brazilian '*Oncidium*s' from the group originally defined as *Oncidium*. I am however struggling to see the green *Gomesas* and the *Oncidium* like *Gomesas* as one branch of the tree.

The pub test. There is an old saying in Australia, "will it pass the pub test". The concept is to ask whether a particular behavior, or answer given, makes common sense.

Scientists now tell us that they have proven by DNA analysis that some sheep (*Oncids*.) are really goats (*Gomesa*).

I sometimes wonder if there ought to be a special rule in life that before you make a decision or reach a conclusion you should first step back from your work and ask yourself if it makes sense. If the science or the maths tells you something that does not look right or 'does not compute' as the younger generation might say, it might be because you made an error or even that you got the right answer to the wrong question.

Perhaps I am wrong in questioning the *Oncidium*/*Gomesa* relationship but if Chase and co. are correct, there must have been one hell of an evolutionary jump at some point to go from those *Oncidium* looking orchids to what we previously understand a *Gomesa* to be. But enough of my old man philosophizing.

Both *Gomesa recurva* and *crispa* grow well in a cool shadehouse here in Sydney. We regularly see them benched as smaller plants but the lovely little specimen benched by Lisa last month was especially good. All the bulbs and leaves were healthy and the plant was thriving under her care. Congratulations Lisa. Really well done.

Article Next Page on Erythrorchis – I am envious that our Secretary Jenny Richardson got the chance to see this amazing orchid. I have known of it for years but have never seen one in real life. I am also thankful for, and in awe of, the amazing job she did in producing such a beautiful and comprehensive article. I hope you all enjoy it as much as I did. Thank you Jenny. Jim Brydie

Erythrorchis cassythoides – as good as it gets – by Jenny Richardson

Erythrorchis cassythoides (*Galeola cassythoides*) is one of our unique and beautiful Aussie native orchids. The genus



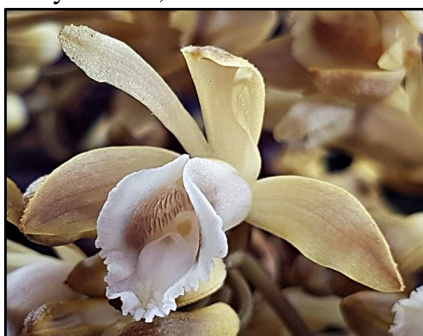
Erythrorchis belongs to subfamily *Vanilioidea*. You can clearly see by the capsules shown on the next page, that they are related to the vanilla orchid. *Erythrorchis* has two species of terrestrial, climbing, leafless, mycotrophic (explanation later) orchids, *cassythoides* and *altissima*.

Erythrorchis Cassythoides is endemic to Eastern Australia and is found in near-coastal areas and nearby tablelands from Waterfall in the Royal National Park in NSW up to the Blackdown Tableland in Qld. at elevations of 50 to 500m.

Altissima is found in Japan, Ryukyu Islands, Taiwan, Chinese Himalayas, Assam, Eastern Himalayas, Myanmar, Nicobar Islands, Thailand, Vietnam, Malaysia, Borneo, Sumatra, Java and the Philippines in valleys on tall trees at elevations of 300 to 900m. [ref: IOSPE](#)

As wonderful as it is to see the fantastic array of blooms brought in by our members each month, nothing beats seeing a display put on by Mother Nature. There is something very special about seeing an orchid thriving in its natural environment. I was blown away by this exceptional specimen of *Erythrorchis cassythoides*, on a trip to 'the Shire'. That's Sutherland Shire encompassing the Royal National Park, for those who are not familiar with that term of endearment - or insult, depending on where you grew up, for me definitely the former.

I'm not a judge, but this magnificent plant would surely be worth an FCC, it was proudly displaying the very best of every feature, a result of what can be achieved when conditions are ideal. Over 40 stems, snaking five to six meters



up the tree with an abundance of stunning blooms. I could hardly contain my excitement! There must have been thousands (*no I didn't count them - refer to photos above*) of closely bunched, creamy, yellowish flowers on branched inflorescences. The trumpet shaped, softly contrasting white lip has a very attractive frill around its edge. The multiple inflorescences sprout from nodes along the length of their robust, 'pimply' reddish black stems as they wound their way up the trunk – reminiscent of Jack's beanstalk. The stems give rise to their common name

'Bootlace Orchids'. Based on the plant I saw, it would have to be a giant's boots (perhaps Gomagog's), as the stems were much thicker than any bootlace I've ever seen. The photo to the right shows the bumpy surface of the stems and in the background you can see one of the yellowish, fleshy roots originating from the nodes that secure the stems to the tree. Considering the size of the plant, the unbranching roots are surprisingly small, averaging about 6cm long. The majority of these roots hadn't embedded themselves into the crevices in the bark the way you would see with most epiphytic orchid roots on a rough barked tree. Certainly there were some roots that had sunk themselves into the bark, but the majority seemed to form their connection only at the tip. It reminded me of how a leech attaches its mouth to its prey. I found this surprising considering there must be a reasonable weight once the stem is 5-6 meters up a tree & heavily laden with blooms. Perhaps it is an evolutionary attribute, as the tree of choice is a smooth barked Eucalypt on which a single, strong point of attachment would be more practical than trying to achieve sufficient traction by embedding roots in a bark surface that is smooth. Perhaps another reason is that despite the impressive height these reach, they only have to hang on for one season - long enough to bloom, form capsules & spread their seed, after which the stems wither away. New aerial stems are produced autumn to spring.



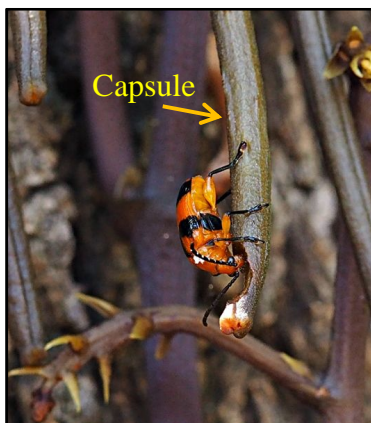
Emerging from underground, the stems have no leaves, so there is nothing to interrupt the profusion of pleasantly sweet, honey scented flowers. The ~2 - 2.5cm flowers have a gently drooping aspect which places them perfectly when you are standing at the base of the tree looking up into their pretty little faces. As you can see in the photo far left, this created the impression of a thick carpet of flowers that seemed to stretch on forever as they meandered their way skywards. The next photo shows another plant that had not yet found a host to climb, you can see the tightly packed orientation & shape of each bunch of buds forming an umbrella like profile. Not designed this way for our viewing pleasure, although that is a happy side effect, flowers usually point downwards to protect their sexual parts from the rain. I was told the pollinator is a small native bee, attracted by the inviting honey sent they offer.



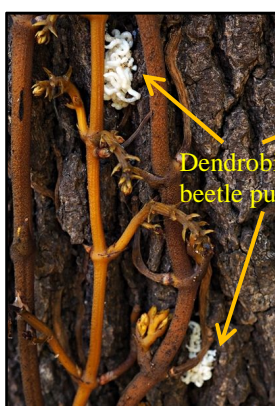
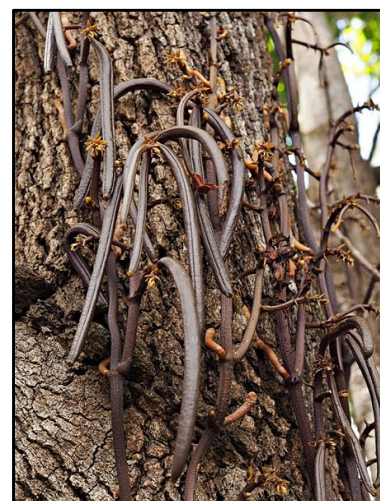
I showed my brother some photos as soon as I arrived home & he was so impressed we went to see it together the following week. My

plan was to return to take photos as the seed capsules developed. The only reference I could find with timing, mentioned capsules in February, so I was going to visit the site periodically until they started to form & take progressive photos. Far out! luckily my brother knew how keen I was to see them so he stopped by about 4 weeks after we visited the site together & he sent me this video <https://www.youtube.com/shorts/TctLe77cGfs> Yes, logical I know, the capsules are obviously going to start developing as soon as the flowers fade but hey, I'll know better next time & thanks to my brother, I was able to go the next day to get some shots of the impressive display as shown in the photos to the right.

After taking photos for a while, I became aware of something orange out of the corner of my eye



see photo to the left, on closer inspection I realised it was a dreaded dendrobium beetle, head buried deep inside a tender capsule chewing incessantly. I couldn't locate its mate but I'm guessing that was munching somewhere close by. Despite the resulting damage to this &



I'm sure a few other capsules by these unwelcome visitors, hopefully a hefty number of the millions of seeds that will be released from this bountiful crop will find their happy place, ensuring there are lots of these beauties for many years to come. On subsequent visits a tell-tale sign of quite a bit of dendrobium beetle activity was

evident from the spattering of spaghetti-like pupae nestled into crevices in the tree bark as shown in the photos to the left. Following the emergence of new growths, I saw a pair of the rotters munching into the fresh, pimply, pinkish white stems shown above left.

I first saw the plant in full bloom early October, four weeks later the capsules were 4-6cm long, a week later some were 8-11cm long and 6-8mm diameter. As the capsules developed they changed from a deep olive green to black. Some references say the capsules reach 20cm but there were none that length on this plant, perhaps the sheer number of them resulted in a crop of shorter capsules. They seemed to reach maximum length by ~5 weeks but continued to fatten a little more over following weeks.

The photo below left shows a capsule mid January, 14 weeks after flowering when just a few of the capsules had



stared to 'stretch' at the seams but remained sealed. Three weeks later, the next photo shows pretty much all the capsules had split and were spreading their precious cargo with each gust of wind.

This is the first time I'd seen this orchid but a very experienced orchid grower told me that it was the best flowering they had ever seen. It's what you could call a 'perfect storm' of conditions, La Niña providing abundant rain & there was a thick, spongy layer of mulch & leaf detritus on the ground, you literally sank down into it as you walked around the trees. Although the tree of choice would probably be a Eucalypt at the appropriate stage of decay, the main

plant I saw was on a dead *Casuarina*. In the immediate area there were multiple Box Brush, *Lophostemon confertus* & *Casuarina* providing dappled shade but the area was bright & sunny. Different plants of *Erythrorchis cassythoides* were using all tree types as their climbing posts. The constant presence of underground fungi is essential to this



orchid's existence. Even above ground it was fungus heaven with a variety of fungi, unrelated to the orchids needs, including *Pycnoporus sp.* a vibrant orange bracket fungi, see photo to the left. There were also some excellent specimens of a type of horse hoof fungi, *Fomes fomentarius*. You can see in the photo to the right where the common name comes from. The brackets of *fomentarius* grow slowly adding a growth ring each year, they can live up to 30 years. If stuck in the bush they can serve as excellent tinder producing a very long lasting smolder emitting an intense heat.



There is no hope of reproducing all these factors artificially and it is illegal to remove native orchids from the bush without a license. If you are lucky enough to discover any orchid *in situ*, enjoy, photograph, but ***please*** leave it where it is so you & others can return year after year to gaze at it in wonder. Some of our native Australian orchids are easy to cultivate (from legal sources) but this is absolutely not one of them.

Erythrorchis cassythoides is a terrestrial (climbing vine) orchid which blooms in winter and spring. In summer after the capsules mature & release their seeds the stems start to die back, eventually leaving only their extensive, fleshy underground root system. How amazing is that! Initially when I was talking to my brother about it, we thought a plant that reached 6m in height must have been gradually winding its way up the tree for some years but apparently not. Speaking to an experienced orchid grower, the indicator of the age of the plant was how many stems were coming from the same root system. The estimate for this plant was ~50 years old – you can see the numerous stems in the photo to the left. There were quite a few plants amongst the same stretch of trees, most had only 1-4 stems. The magnificent specimen plant was definitely the Mama of the area.



On my visits from Oct-Apr I noticed the smaller plants had not produced capsules and those stems had started to wither. Although you could tell they had started to dry a bit, the stems on big Mama remained quite robust, holding their crop of capsules high up the trunk of the tree, wilting only after the seeds were released.

Erythrorchis cassythoides is what is referred to as a mycoheterotroph. Autotrophs (usually plants) produce their own food through photosynthesis or chemosynthesis (using energy from chemical reactions to generate food). Heterotrophs (herbivores, omnivores, and carnivores) can't synthesise their own food so they consume other plants or animals for nutrition. https://www.diffen.com/difference/Autotroph_vs_Heterotroph So what happens when a plant can't photosynthesize? Mycoheterotrophy is a relationship between plants and fungi in which the plant gets all or part of its nutrition from parasitism upon the fungi rather than from photosynthesis. [ref: Wikipedia](#)

All orchids are reliant on mycorrhizal fungi at some point in their life cycle when they are non-photosynthetic & therefore require an external source of nutrients. Artificial germination can be achieved in many species without fungal infection if an external source of sugar is provided. However, most orchid seeds will not germinate in the wild

unless they have been infected by an appropriate fungus. Fungal infection does not guarantee success; the orchid cells might reject the fungal infection, a parasitic infection could kill the cells, or if the mycorrhizal interaction is successful, germination will occur. If you have ever seen orchid seeds they are really, really tiny and have minimal nutrient reserves of their own. Initially the fungus may be the sole source of nutrients but most orchids develop chlorophyll, which is essential for photosynthesis, and therefore become less dependent on mycorrhiza. However, there are around 200 species of orchids including *Erythrorchis* that remain achlorophyllous throughout their life. http://www.davidmoore.org.uk/assets/mostly_mycology/diane_howarth/orchid.htm

Orchids that cannot photosynthesis are referred to as full (obligate) mycoheterotrophs, these get all their food from the fungi they parasitize throughout the life of the plant. In the past, non-photosynthetic orchids were believed to get food from decaying organic matter similar to saprotrophic fungi. These leafless orchids were referred to as saprophytes. However, the current understanding is that such plants are not capable of extracting nutrients from breaking down organic matter so they must revert to parasitism. The interaction occurs between the roots of the plant and the mycelium (root like network of fungal threads) of the fungus. In mycoheterotrophy the net carbon flow goes from the fungus to the plant. ref: Jakalski M, et al., 2021, *Front. Plant Sci.*, 09 June 2021, Wikipedia

I've seen orchids seeds before from *Bletilla striata* & a few Aussie natives, if you give the split capsules a gentle tap, a cloud of 'dust' floats out & the wind carries the tiny seeds away. I'd only ever see this with the naked eye & I assumed it was many, many tiny seeds being released.

Looking through the magnification of the camera lens I realised whilst my assumption was correct, I had been unaware how much wonderful detail I was missing. As shown in the photo to the right, each shiny, brown *cassythoides* seed is embedded in its own translucent 'wings', shaped kind of like a slightly asymmetrical tadpole, aerodynamically designed to carry the seed far & wide on the wind or perhaps in the fur or wings of any creature that might bump the stems releasing a plume of seeds. I tested a few in water & they floated very well so that could be another means of distribution. Each seed including its wings is only about 0.05 – 0.07 mm wide, so the seed itself is miniscule.



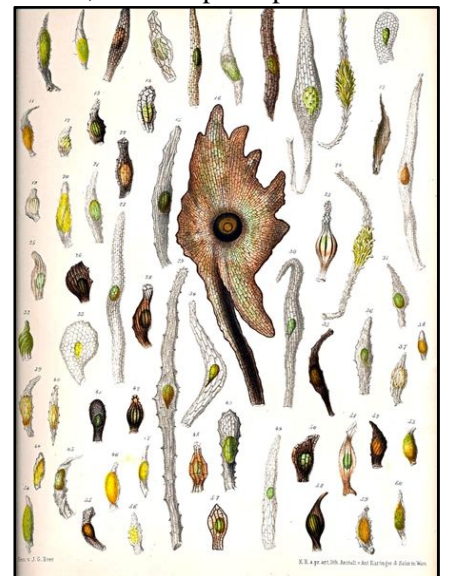
The photo below shows an open capsule with its cargo of very densely packed seeds. That would certainly be a case of once unpacked the contents would *never* go back the same way!



How fascinating, and it makes sense, when a plant produces such an abundance of seed it often means there is a very low survival rate so Mother Nature does what she can to provide the means for the greatest dispersal of seeds in all directions in the hope the

lucky few will find the perfect conditions to germinate.

I'd never really thought about it before but it made me wonder if *Erythrorchis cassythoides* just happened to have this unique structure or if all orchid seeds were like this. A quick search on Mr Google revealed an array of wonderful designs of all shapes for encasing & transporting various orchid seeds. The figure to the right is taken from Beer JG (1863) *Beitr ge zur morphologie und biologie der familie der orchideen*. Carl Gerold's Sohn, Vienna, and shows intricately detailed drawings of different orchid seeds – they must have had pretty good magnifying



glasses way back then! There are some amazing electron microscope photos on the internet if you are interested, showing how accurate Beer's drawings are. One of the many wonders around us that you can walk past, or stop to investigate & enjoy.

Late March, four & a half months after the flowers bloomed the cycle was well on the way again. I was intrigued to see the pinkish white colour of the new growths emerging from the undergrowth (see left), how long I wonder until they develop the characteristic reddish black hue. There were many stems poking their heads above ground by this stage, some already ~60cm high, it will be interesting to visit them over the coming months to monitor their growth rate. The rain has been plentiful since last season so I'm hoping it will be another good display this year but considering the energy it must have taken to produce the massive crop of capsules only time will tell.