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

(Established in 1947)
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Annual Membership : **$15 single, $18 family**

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President : Dennys Angove 043 88 77 689
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Editor (and stand in Cttee. member) Jim Brydie
Society mail to - PO box 1501 Lane Cove, NSW, 1595

Committee Jessie Koh (Membership Secretary / Social Events)
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Committee : **New committee members are required**
Committee : **Please put your hand up to help**
web site (active link) : http:/kuringaiorchidsociety.org.au
Society email : kuringgaiorchidsociety@gmail.com

Next Meeting : **Mon 21st October 2024**

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

COVID remains in the community. **In consideration of others, *PLEASE stay home if you are not feeling well.*** We prefer all meeting attendees to be Covid vaccinated, masks are optional.

Please note : For insurance purposes, you now need to **SIGN** the **ATTENDANCE SHEETS** at the **front door on arrival**. Please sign against your name rather than just using a tick.

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

Our Culture Class – There will be no culture class this month so that members have adequate time to check out all the plants that will be put up for sale at the members Auction.

The sales table will be open as usual but as announced previously, please respect the ***"Sales Table Open / Sales Table Close"' sign*** and work with the sales table managers**.**

The Supper Break – The society supplies the tea, coffee, milk, sugar etc, **but *members are asked to bring along a contribution for the supper table* -** cake, slice, or biscuits, etc. ***There have been some excellent offerings lately – Thank you. Keep up the good work members, show us what you can do.***

AND - please everyone, *bring your own mug or cup for tea or coffee*.

Our only Supper Volunteer this month is John Chang and so we are looking for another helper on the night please. Thanks for putting your hand up John. I am sure we will get you help.

Remember - Supper is not self-serve, PLEASE DON'T go get your own - helpers are used to minimise handling

After the tea break, in place of a Guest Speaker we will be holding our annual Members Auction. Each single membership is invited to bring 2 'lots' for auction, family memberships may bring 3 lots. A 'lot' may be a single orchid or a bundle of more than one to be sold together. More details can be found on pages 2, 3.

Best of The Evening – Species - Epidendrum stamfordianum - grown by Lesley & Garrie Bromley
The past few years in a row Garrie and Lesley have benched magnificent specimens of this species. They grow it just so well that I can't resist continuing to give it it's write up.

As we mentioned at the meeting in our plant discussion, it is an unusual Epidendrum because as a plant it looks more like a Cattleya with tallish (20-30 cm), spindle shaped pseudobulbs *(ie narrower at the bottom and top and broader in the middle)* growing along a rhizome. As opposed to the many Epi's that have long willowy reed like stems with leaves all along their length.

Stamfordianum is also unusual in that its inflorescence sprouts from the base of the last season's pseudobulb, instead of from the top of a pseudobulb like the rest of the Laeliinae family. It seems to perhaps be an inflorescence coming from an abortive new pseudobulb that is replaced by a normal new pseudobulb growth after the flowering finishes. Whatever the genetic mechanism, it certainly makes for a wonderful display of many lovely 4 cm flowers all showing off just below the leaf canopy of the orchid. For more detail on growing requirements, refer to the Nov 2022 bulletin or the internet.

Congratulations Garrie and Lesley. Each month you really show us what orchids are supposed to look like.

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 September meeting had 40 people in attendance, with 13 apologies and one visitor. I thank all those folk who helped with setup and pull down. Although setup started slowly it finished very quickly and it proves that it does make it easier with many hands. Supper was great and thanks go to **Lisa** and **Nancy** for making it work so well and to those who brought in the goodies. **Jim** ran another interactive mini-doctor's session which was engaging. Thanks also go to **Janine** for selling the raffle tickets. **Jim** had a busy night since he also helped run an even more interactive session after supper and I thank **David, Trevor, Jean** and **Garrie** for their bench-picks and informative talks. It was a great way to finish any orchid meeting. Our October meeting is the AGM and since I will not be standing as President, this will be my last contribution to the bulletin in the form of the **President's Desk**.

Another walk in Bunyip Forest **–** As indicated in the last bulletin, I live near Rofe Park in Hornsby Heights. I have always had trouble finding orchids growing there and even after going on walks with **Chris** and going on one of **Jim's** walks which is about 2 km away from Rofe Park, essentially to learn how to find them. I have never found the orchids until this year. Last month you may remember I found a sun orchid (*Thelymitra*) flowering. I looked at it for a long time since it stood out so clearly against the bush. The same thing has just happened again since I went a few days later and although the sun orchid was gone, not far from where I found the sun orchid, I found a purple-bearded orchid (*Calochilus*). It was easy to find since it was next to the track and stunning. Again, I went back a few days later and it too was gone.

Orchid Hunting – I always look for orchids when I go away and so I wondered if there was a simple method to increase the chances of success. I went onto the web and found this interesting 2021 article in "The Conversation" some of you may enjoy. To me the fun is to find, identify or, just be in the bush with a flask of tea, cake and hat.

https://theconversation.com/orchid-hunting-has-come-a-long-way-in-5-steps-you-can-join-a-national-research-effort-172383

Member's plants sales – Members who have plants for sale at our meetings please make sure they are in good order for sale. Just bring them in and put them on the 3rd table with a yellow label with the price and your name. However, it should be remembered that sales cannot occur until the sales table is **OPEN**.

Attendance **–** Please remember to wear your badges and sign in on the attendance sheets. Find your name and sign to help keep our insurance risk as low as possible. Visitors should add their name in the box provided on the last sheet.

Orchid Assistance – Personal challenges occur all the time, so if you need help with your orchids, contact the Society on our email address and we see what we can do to help.

Wearing masks – COVID is still around. So, please feel free to continue to wear a mask at our meetings and hand disinfectants will be available.

Other Society News

1. New Members - Robin Stewart & Ronnie Mullan have now signed on as new members. Welcome to the club both of you. I hope you enjoy the lovely orchids you see benched and if you want to learn more, then that is what we can provide. Members, please say hello to Robin & Ronnie and make them feel welcome.

2. Our GCP bulk supplies order - is available, if you have been waiting for any standard items that were out of stock, please let us know in advance so no-one misses out.

3. October is our Club's Annual General Meeting - The AGM is where we receive an annual report from the outgoing committee and then elect a new committee for the coming 12 months.

We have some nominations for committee already but are happy to hear from anyone else who is willing to come on board. Once the annual report has been received, the President will adjourn the General Meeting and hand over to a guest chairman to run the election of officers.

4. October is also Members Orchid Auction night.

Each single membership is invited to bring 2 'lots' for sale by auction , family memberships may bring 3 lots. A 'lot' may be a single orchid or a bundle of more than one to be sold together. You may place a reserve price on each lot you sell but whatever it sells for, the society takes 15% commission.

Plants need to be clean, and pest and disease free. Better looking orchids obviously sell better and the better info you provide about the lot the better it sells also. If you can provide a picture of the flower, that is a great help.

The Way the Auction Works

(and members, please remember, the sales table is also available to sell orchids and may be used auction night)

A. ***Auction in General*** **–** Remember participants, you don't need to fill in a form to buy or sell. ***For sellers***, ***Lina*** will be managing ***the booking-in process (see below).*** She will set up an intro point somewhere in the entrance hallway or nearby and you need to see her **before** you put your plants on the auction display tables. ***Buyers***, when

bidding, you just need to be bold and put your hand up to bid and make sure you are noticed. Speak if you aren't noticed. AND NOTE : if the lot is 'sold' to you, ***you must pay cash on the night before you go home***.

B. ***Specifics for sellers***, (a). Go to Lina and get a benching card for each sales lot. Take the cards away and fill in the plant name, your name, and reserve price (if any). Much the same as for benching an orchid. (b) Take the cards back to Lina where she will assign lot numbers to go on the cards. (c) Now place your auction plants on the auction bench with the card in front. The cards then will remain with the plant throughout the auction until it gets to the auctioneer. (d) it helps to sell if you provide a picture with a plant that is not in flower.

C. ***Reserve prices*** **-** You may set a ***reserve price*** on any lot. If you do, ***in addition to it being written on the benching card we ask that you also clearly & visibly label the plant separately with the reserve price.*** When the potential buyers are checking out the plants and deciding bids, its helps them be ready and decided before the sale.

D. ***Reserve Price Tags*** **-** *In past years we have used yellow tags/price stickers to make the reserves obvious.* It doesn't matter what you use but please make sure bidders & auctioneers know what you are asking for the lot.

E. ***Presentation*** **–** In real estate the mantra is location, location, location ***but in selling plants it is appearance, appearance, and information.*** Clean up your plant and show it at its best. If it looks messy and poor, you will get half what it might be worth. And if it isn't in flower, ***put a picture on it. Show the buyer what it is***.

F. ***Plants must be Clean and Free of Disease*** **-** Lots are inspected when they are booked in. We reserve the right to reject plants believed to be suffering from pests or diseases, or not well established, or not in good condition.

G. ***The Money*** **-** The society takes a **15% commission** on the selling price on all sales.

PAYMENT - Buyers must pay with cash before they go home. There is no credit card facility. Please bring cash in appropriate size notes. Don't expect the society to have change for large notes if you spend just $10.

Sellers are paid the following month due to the workload on those running the paperwork during the auction.

Coming events

Sat 12 Oct – ***Orchid Species Auction and annual show***, 9.30 am to 3pm 43 Eaton Rd West Pennant Hills Community Church – auction catalog and show schedule are available online .
Wed 16 Oct 10am to 1pm – ***KOS Huon Park Outreach event***, 381 Bobbin Head Rd, North Turramurra

Best of the Evening Hybrid – Dendrobium unknown - grown by Paul and Loretta Au

What a shame this one is officially an unknown. It looks for all the world like a superior form of Dendrobium nobile that doesn't mean it is Den. nobile.

When mankind first started to deliberately make hybrids in the late 1800's, the softcane Dendrobiums, and more specifically Den. nobile, were some of the first to be used in experiments.

All the original orchids cultivated by man were species imported from other parts of the world and because Den. nobile just happens to be one of the most easily grown and proliferated species, it was an obvious candidate for experimentation.

Between 1864 and 1899, Den nobile itself was crossed with 15 other different softcane species looking for variations in colour, colour patterning, flower and plant form. And probably more often than not – just because plant A and plant B happened to both be in flower in the same greenhouse. In the same period many of those resultant hybrids were also crossed and backcrossed. It is hardly surprising that quite a few of the resultant early hybrids look rather like Den, nobile or perhaps larger or better versions of nobile but unfortunately we don't have photographs of those old hybrids and written descriptions and drawings are rare and precious so it is impossible to compare a living specimen to our historic records.

Thus, even though I might say this one looks like a nobile to me, it could just as easily be a hybrid dominated by nobile. Some of the classier, older, nobile hybrids were Den Lady Coleman, Den Plumptonense, and Den Merlin but in more modern times there have been many more nobile look alikes made deliberately to improve on what we think a perfect nobile would look like.

So how does one grow this group we call 'Softcane Dendrobiums'?

Well the fundamental key to growing and flowering these well is in understanding the natural seasonal growing cycle of the type.

These are northern hemisphere orchids from the countries along the slopes of the Himalaya mountains. In nature they go through a dry autumn winter and a very wet fast growing period from about mid spring through summer and ending in mid autumn. In many areas it is called the monsoon season.

For we Southern Hemisphere growers the calendar month seasons are the opposite to the northern hemisphere so that translates to the following culture regime :

Sothern Hemisphere Softcane Culture

1. ***Growth Cycle*** - The most important thing you need to know about growing softcanes is that they grow like crazy for six months (late Nov through April), and they sit almost dormant for the other six months. They tolerate our winter cold because in winter they are virtually dormant. During this period you do not give them any fertiliser, and you only give them the bare minimum of water to avoid excessive desiccation.

If you overwater, or feed them during the dormant period, they may keep growing a little but at best all you are doing is making the plant taller and more clumsy than normal and at worst the roots may rot away and the plants will not be in condition to flower properly when the season changes. A miss-treated softcane will often produce baby plants with roots ('keikis') from what would have been flower buds, as a survival mechanism.

In September plants break dormancy and buds appear on the flowering canes. Peak flowering time is around mid Oct, some flower a little earlier, some a little later. At this time the plant has not yet begun its new seasons growth cycle. It is flowering in accordance with its genetic rules and the end of its winter dormancy period.

Also in Oct., while the plant is still in flower, the new seasons growths (new canes) begin at the base of last years canes. ***However***, you do not start fertilising or full watering until these new growth are well under way, ie at least 7 to 10 cm tall. This is the time the plant begins to produce a new flush of roots for the coming season. The plant hasn't really started its new seasons growth cycle until this point so don't start early.

2. ***Fertiliser*** – Your objective is to grow a good strong cane during the summer and early autumn to get good flowers in following seasons. Most Sydney growers start their feeding program for the year in the 1st week of November.

I recommend you start by applying soluble fertiliser once per week. I use it at half the strength recommended on the packet. The aim is to get the maximum growth into the new cane during its short growing season without making the new growth too soft and sappy. The aim should be for a fully grown cane, between 60 and 90 cm tall, by early April.

I believe this can be achieved with fertiliser application (always soluble feriliser at half strength) twice a week between December and the end of February, and back to once week for March. By that time the new lead will have just about reached its maximum height.

As the cane grows, you will notice that the leaves are produced on alternate sides as the growth develops and the cane (pseudobulb) grows taller. Leaves emerge from the top of the growing cane and as the cane expands upward, the new leaf moves to the side and anew leaf appears from the top. When the growing season ends, the last leaf produced will be left standing vertical on top of the cane. When you notice that the newest leaf isn't moving to the side, this tells you growth has stopped. You must now stop applying fertiliser. NO MORE FERTILSER IS GIVEN UNTIL GROWTH STARTS AGAIN NEXT SUMMER (about Nov.).

Note: I specifically recommend soluble fertilisers because I believe that type of fertiliser best helps me keep track of when to next apply fertiliser.

I am aware that many growers use slow release fertilisers very successfully so perhaps the problem for me is just one of my personal usage patterns but unless I put a tag in the plant with a date on it I was never able to know whether the slow release pellets I could see on the pot were still functional or not.

In addition I believe that the rate of release of nutrients from slow release fertiliser pellets is too affected by temperature and the moisture level of the medium.

A third alternative, pelletised organic fertilisers like Dynamic lifter are very useful, but they contain a lot of fibrous solids that eventually clog the air spaces in the medium of epiphytic orchids as the pellets decompose and they may cause a need to repot more often.

Congratulations again Loretta and Paul, you are bringing some lovely orchids to bench and we love to see them.

God Made us - A little girl was sitting on her grandfather's lap as he read her a bedtime story. From time to time, she would take her eyes off the book and reach up to touch his wrinkled cheek. She was alternately stroking her own cheek, then his again. Finally she spoke up, "Grandpa, did God make you?" "Yes, sweetheart," he answered, "God made me a long time ago."

"Oh," she paused, "Grandpa, did God make me too?" "Yes, indeed, honey," he said, "God made your mother a few years back and also made you, just a little while ago."

Feeling their respective faces again, she observed, "God's getting better at it, isn't he?"

Church Noticeboard - Ladies, don't forget the Saturday rummage sale. It's a chance to get rid of those things not worth keeping around the house. Bring your husbands.

Best of the Evening Novice – Paphiopedilum liemianum 'Tom #6' - ***grown by Nancy Yao***

(a repeat of many basic species information from the July 2018 bulletin)
Of all the slipper orchids, the multiflowered types are by far my favourites. Some need to be grown a little warmer, but many will grow cold. Please note though, if you would like to try them, patience is required. They can all be particularly slow to grow up from a seedling to a mature flowering plant.

Paph liemianum is one of a sub group of about 8 species known as Section Cochlopetalum. The section name comes from the Greek word Kochlas, meaning spiral shell and referring to the more or less spiral twist in the petals of these species. The other Cochlopetalum species **(pictures below)** are glaucophyllum, moquettianum, chamberlainianum, victoria-reginae, primulinum, victoria-mariae. There is also now a new one, Paph dodyanum from Indonesia, that was only formally accepted as a species in about 2017.

All these have a *sequentially flowered* inflorescence with usually only one or two flowers open at a time. Generally, by the time the second flower opens, the first is reaching its life's end so most of the time there is only one. Still, this sequential process can mean that an inflorescence can be flowering for 6 months with the spike gradually getting longer and sometimes the flowers getting smaller as the spike extends.

As you can see, sequential flowering has its advantages and disadvantages but the individual flowers are certainly very attractive. Renowned Sydney grower Dr Seong Tay made the selfing that has created a number of cultivars named "Tom", many of which have already been awarded.

Paph liemianum is found only in northern Sumatra at elevations of 600-1000m, on vertical limestone cliffs and on the ground in humus around the cliffs. They flower in the late winter to early spring. Plants are medium size with leaves 20-25cm long by 3–4 cm wide. It has a short inflorescence for one of this group, usually only 30cm or so but can be a bit longer. The flowers/buds are tightly packed together and flowers are about 10cm across the petals.

chamberlainianum

moquettianum

glaucophyllum

primulinum

victoria-reginae

victoria-mariae

Liemianum comes from the tropics, and from moderate elevations, so I would assess that it needs protection in winter.

Culture: The following, based on extracts from a Paph growing article in a Canberra Orchid Society newsletter, give some solid, wisdom filled, common sense insights into growing all Paph orchids:

- it may seem an unnecessary statement, but to grow Paphs, you must grow roots on your plants. They are basically terrestrial by nature & have no pseudobulbs to store water, so a healthy root system is vital. If the mix gets too wet or too acid the roots die, the leaves desiccate, and maybe the plant dies. There are no pseudobulbs to fall back on.

- Paphs require a growing medium that retains some moisture but absolutely does not keep the plant wet. If the plants were to be repotted every year, a medium of just medium to smallish bark would probably suffice, but few of us are disciplined enough, or have time, to repot strictly annually. As a result, you need to take steps to open the mix and make it last longer without getting too wet or too acidic. You might do any or all of: adding something like non degradable styrene foam; use slightly larger bark; pot in terracotta pots to aid drying; add a little dolomite.

Personally, I use a mix of multiple bark sizes to get a blend of moisture retention and air flow/drainage. I also add about 20% by volume crumbled styrene foam (the softer type), I use terracotta pots for my larger plants and always try to sprinkle some dolomite over the finished pot after repotting.

When you are growing Paphs, keep an eye on the health appearance of your plant. If it starts to look sick, it is almost always worse than you think. Tip it out of the pot immediately and check the roots. If they are in fair condition but in decline, repot into fresh bark. If the roots are nearly gone, you might try potting into as small a pot as possible and use tightly packed sphagnum moss. Water sparingly until it looks like it is in recovery.

Congratulations on a very classy orchid for the novice section Nancy.

Technology - A man was telling his neighbour, 'I just bought a new hearing aid. It cost me four thousand dollars, but it's state of the art. It's perfect.' 'Really,' answered the neighbour. 'What kind is it?'

'Twelve thirty.'

Some other lovelies from the Sept 2024 Meeting

1. RLC Meg's Purple Flare 'Meg'

2. Cym. Sleeping Nymph 'Glacier'

3. Cattlianthe Trick or Treat

1. RLC Meg's Purple Flare- Another delight from Garrie and Lesley's glasshouse, and what a lovely orchid. It is such a delight to see these gorgeous orchids every month and not just from Garrie and Lesley. I also know the Bromleys have been doing a great job teaching on the side for years as well.

I know this is a cross Garrie made himself and which has a story - as do many Garrie's orchids. I believe that back in the day it was Dennis from Dendi orchids that arranged the flasking and sales of many of Garrie's crosses and that Dennis raised the first cultivar of this cross to get awarded. A thumbnail of that one, Meg's Purple Flare 'Dendi', is shown at the right from when it was awarded. The later cultivar 'Meg' (above) was grown and named by Garrie after one of his garndchildren and it is a ripper. Not awarded yet but surely not far from it.

Garrie mentioned that the earlier one 'Dendi' has one low quality in that it is a relatively short lived flower but that "Meg' lasts around 4 weeks. A really lovely orchid Garrie.

2. Cym. Sleeping Nymph – I have always liked these 'albino' type Cymbidiums. Where in this case 'albino' means a lack of all red pigmentation. Which means of course that albinos can come in white, yellow or green or combinations of those. They occur on both the full size types and the mini's based on pumilum.

There have been a few breeders work on producing these. Sleeping Nymph was registered by Valley Orchids in South Australia but Alvin Bryan from Cronulla in Sydney also concentrated on these for a while.

But whatever its background, I think Sleeping Nymph is lovely.

3. Cattlianthe Trick or Treat – what treat this cross has been since it was first made back in 1973 by Fred Stewart Orchids in California. The brilliant heads of bright orange flowers have been popular ever since and has been a direct parent of 226 hybrids and is part of the background of nearly 600 hybrids.

Its gene mix is that of just 4 species – one yellow (Cattleya crispata) and three orange (Cattleyas cinnabarina and harpophylla, and Guarianthe aurantiaca) and seems to have gained something positive from each.

4. RLC Christmas Beach

5. Den. Yukidaruma

6. Den. heterocarpum

4. RLC Christmas Beach - This is really lovely hybrid that is very reminiscent of its wonderful yellow parent Cattleya dowiana. It is a curious fact that man has found it quite difficult to produce really buttercup yellow Cattleya hybrids. The paler yellow here is very like the yellow of the species dowiana although at least it has also retained the amazingly rich lip of dowiana. I can see that the much brighter but smaller Catt. briegeri has also been introduced and may darken the yellow further down the hybrid path but even so, isn't Christmas Beach just lovely as it is?

5. Den Yukidaruma - is a very famous softcane hybrid and often features on our benches. There are few prominent cultivars – "King", "The Queen", and "Bleeding Heart" are three of the most favoured. I suspect this one of David Floyd's may be "King" but without a label it can't be said. In years gone by I grew the "King" and found it a trifle

inconvenient because it is so tall growing. It would get to 90 cm and was hard to transport. These are all very hardy orchids in Sydney and make magnificent displays with their white flowers and purple eyed lips.

6. Den. heterocarpum – now isn't this a curious happenstance. Probably the very first Den. Nobile hybrid ever officially made (in 1874) was between D. nobile (see Paul ad Loretta's BOE) and Den heterocarpum (above) and perhaps we saw both benched last meeting. What is more, I am pretty sure there are scruffy old divisions of Den Ainsworthii divisions still in many collections about the place, including mine.

Now why would anyone cross these two species and what were they looking for? I suspect it was just because the flowers were out at the same time and the species were both 'softcane' types and therefore perhaps related. There is however, variation among Ainsworthiis - most are variations of white tepals and a purple lip but there is also a variety with pink edging around its white sepals and petals.

7. Paph. Makuli

8. Paph. Hung Sheng Red Apple x Grande Mayne

9. Phal. Sasquatch x Debbies Choice x Modern

7. Paph. Makuli - And how is this for more history? Well not perhaps with Makuli itself which was only first made in 1974, but Makuli is a primitive hybrid of just three Paph species. It is Paph Maudiae (callosum x lawrenceanum) x Paph sukhakulii. That first cross of Maudiae was made way back in 1900 and is one of that first group of Paph hybrids made once they figured out how to actually do it and to grow them. At that stage they crossed everything with everything to see what happened but Maudiae happened to be quite reliable, attractive, and reasonable to grow so was popular. All these primary and near primary hybrids have since been made over and over of course. Since man discovered different colour form of the species and found many attractive, there has been endless variations to play with. Personally, I have to admit that I find colours like the two above very attractive but I am not sure how I can explain exactly why. I guess I can't be alone though because they really are popular.

8. Paph Hung Sheng Red Apple x Grande Mayne - I think this one may benefit strongly from registration in due course. The cross name is a whopper. Still, Grande Mayne was only registered in 2020 so perhaps its all in progress.

The Red Apple part was a deep crimson red so I assume the other part was to do with shape and elegance because that's what they got. Very nice.

9. Phal Sasquatch x …… etc – Wow, that's another mouthful. Perhaps these complex hybrid names are what we must look forward to in future years. But whatever the parentage, I happen to think this is a really lovely orchid.

The lip is somewhat unusual. Probably reminiscent of those new hybrids with petaloid lips but I can't tell. I wouldn't mind growing a piece anyway.

Fond Memories - Two elderly couples had dinner at one couple's house. After eating, the wives left the table and went into the kitchen.

The two gentlemen were talking, and one said, 'Last night we went out to a new restaurant and it was really great I would recommend it very highly.' The other man said, 'What is the name of the restaurant?'

The first man thought for a while and after a while asked his friend, "What's the name of that flower you give to someone you love? You know, the one that's red and has thorns.' 'Do you mean a rose?' replied his friend.

'Yes, that's the one,' replied the man. He then turned towards the kitchen and yelled, 'Rose, what's the name of that restaurant we went to last night?'

Most people write Congrats because they don't know the spelling of congrajulashions

A boy asks his granny, 'Have you seen my pills, they were labelled LSD?'

Granny replies, never mind the pills, have you seen the dragons in the kitchen?

Adaptations to the Epiphytic Lifestyle by Sue Bottom, St Augustine O.S., Florida USA

True epiphytes spend their entire lives without contacting the forest floor. Epiphytes (epi- means "on top" and -phyte means "plant"), describes plants that grow on tree trunks, branches and even on twigs. In locations where moisture and nutrients are available more or less continuously, such as in wet forests, epiphytes differ little in form and physiology from plants that grow in your garden. Epiphytes are particularly abundant in cloud forests, where the air is always saturated and leaves are dripping from condensing mist. In other tropical habitats many families of plants find it difficult to survive as epiphytes. Orchids are one family of plants that have evolved to the epiphytic lifestyle so thoroughly that they are also found in even the most extreme tropical environments, e.g. dry forests.

There are some orchids that grow in soil or leaf litter, but millions of years of competition led most of the tropical members of the Orchid family into trees where light was plentiful. Leaving the moisture- and nutrient-rich forest floor, however, created many evolutionary challenges for orchids. Once orchids overcame obstacles inherent for life in the trees they evolved quickly into many different genera and species on all continents.

In dry forest environments, water and nutrients are supplied in pulses during unpredictable rain events. There are often extended periods of dryness between storms. Orchids adapted to these dry conditions by obtaining their water and mineral ions through unusual plant forms and major changes in their physiology and/or life history. Two general approaches are avoidance and endurance.

1. Catasetums are drought avoiders. They drop their leaves and go into a deep "sleep" when a predictable and prolonged dry season deprives them of the moisture they need.

2. Cattleyas are drought endurers. They sustain themselves during shorter periods by consuming energy and moisture stored in their pseudobulbs.

Drought avoiders are seasonal growers that restrict most of their vegetative growth to wet periods of the year. Orchids in this group often have thin leaves, which do not function as storage reservoirs. The dry season does not support their normal heavy water use, so foliage is shed and the plants lapse into dormancy. Carbohydrates and moisture are held in reserve in fat pseudobulbs or tubers. When favorable weather returns, new growths emerge to repeat the cycle. Commonly grown drought avoiders are most of the Catasetinae and certain Dendrobiums, Habenarias and Lycastes.

Drought endurers, include major horticultural genera, e.g., the Cattleya Alliance. They require quick adjustments to abrupt environmental challenges to maintain a favorable water balance within leaves. Each time these orchids moisture source dries out, which can take only an hour or two, there is the potential for an extended drought to follow. Adaptations to the epiphytic lifestyle revolve around water relations. Acquiring moisture and preventing the loss of water are critical to their success. Epiphytic orchids survive because they obtain and store water efficiently. These drought enduring orchids have succulent leaves and bulbs for storing moisture, velamentous roots for quick water and nutrient absorption as well as the ability to photosynthesize when moisture is scarce.

3. The living filament is surrounded by a nonliving spongy tissue (velamen), once it reaches maturity, that continues to absorb water and mineral nutrients.

4. Catasetums can grow rapidly during the wet season, storing lots of carbohydrates and moisture in their fattened pseudobulbs.

Roots. Epiphytic orchids have roots adapted to life in the tree canopy. Roots anchor the orchid to its host plant, holding tight even when buffeted by winds. The unique root structure consists of a nonliving, thick air filled layer called velamen that surrounds the living cortex of the central conductive filament. This adaptive velamen structure acts like a sponge, becoming engorged quickly after contact with liquids, so moisture and nutrients can move through the cortex and into the vascular system. This velamen becomes almost impermeable during dry periods, which prevents water from being exuded from roots. The velamen has special cells for gas exchange too, absorbing oxygen for respiration, and, where chloroplasts are present, carbon dioxide for photosynthesis. High porosity potting mixes are recommended for epiphytic orchids to help ensure that roots can be bathed with air. When organic matter in a potting mix starts to break down, the mix begins to compact and effectively smothers the roots. It is not too much water that kills your orchids, it is the lack of air around roots that orchids cannot tolerate.

Pseudobulbs. Many epiphytic orchids have short, thick bulb shaped stems called pseudobulbs. These structures store water and carbohydrates, similar to humps on a camel. Pseudobulbs swell or shrink as moisture is stored or withdrawn, allowing orchids to sustain themselves in seasonally dry areas where plants may experience months without rainfall. Plant morphology thus serves as a general guide to basic orchid culture. The fat pseudobulbs with thick leaves typical of cattleyas suggest the plant is more drought tolerant than thin leaved plants like many Oncidiums. Some epiphytic orchids do not have pseudobulbs, e.g. phalaenopsis, and instead rely on fat roots and leaves for energy and water reserves.

Leaves. Leaves of epiphytic orchids are often thick and succulent and covered by an evaporation retarding waxy cuticle. The more succulent the leaf, the more the leaf interior assumes a water storage role. Less conspicuous features promoting water retention include recessed stomata (pores used for gas exchange), usually on the leaf undersides, and reflective surfaces. Once again plant morphology acts as a general guide to basic orchid culture. Fat pseudobulbs with thick leaves typical of cattleyas suggest the plant is more drought tolerant than thin leaved plants like many Oncidiums.

5. Most cattleya leaves are thick allowing some internal water storage. They have a waxy cuticle to prevent excess water loss.

6. Cattleyas are busy absorbing carbon dioxide during the cooler night hours when humidity is higher, storing it for photosynthesis during the daylight hours.

Photosynthetic Pathway. Life in the trees typically results in what is in effect an arid environment. Most garden plants open their stomata during the day to absorb carbon dioxide for photosynthesis, which occurs during daylight hours. Open stomata during the heat of the day also allows water to escape and evaporate in a process called transpiration. More than 90% of the water absorbed through the roots of garden plants can be lost through leaves thanks to transpiration. This excessive water loss would result in death of an epiphytic orchid. Because carbon dioxide gain and transpiration water loss both occur through the same stomatal opening, some epiphytic orchids use a specialized adaptation called CAM photosynthesis (Crassulacean Acid Metabolism) to minimize water losses. Carbon dioxide is absorbed during the nighttime hours when the stomata are open, and then stored within the leaf for subsequent photosynthesis during daylight hours when stomata are closed. Keeping stomata closed during the heat of the day, and open at night minimizes transpiration losses. CAM plants have a very high water use efficiency allowing them to live in the windy, arid environment in the trees. Of course, the intermediate storage of carbon dioxide has an energy cost, so CAM plants grow relatively slowly, requiring less fertilizer to provide mineral nutrition. This is the tradeoff epiphytic orchids made for life in the trees. The more succulent the plant, the more likely the plant uses CAM metabolism. Thick leaved cattleyas and phalaenopsis often use CAM metabolism, while thin leaved oncidiums often use the more conventional photosynthetic pathway.

Nutrition. Orchids in the tree canopy also live in a low nutritional environment. Dust settling on leaves, nutrients in the atmosphere and even molecules leached from leaves by dripping rainfall provides most nutrients taken up by epiphytes. While fecal material may occasionally contribute to an epiphytic orchid's nutrient balance, such events are rare. Nutrients must be dissolved in water to be taken up by plants. Orchids develop tremendous root systems enabling them to survive and grow in a low nutrient environment as long as they grow slowly. They are also extremely effective in taking up nutrients, especially micronutrients. The velamen of orchids, which is so efficient at absorbing

water, also helps absorb nutrients from rainfall. Poole and Sheehan wrote:

> *Rainfall is a valuable source of nutrients for epiphytic plants since it washes dust particles out of the air and onto them. The atmosphere is also an excellent source of nitrates, especially during electrical storms. Water flowing over leaf surfaces leaches mineral and organic nutrients from the leaves. Thus the leaf canopy of the host tree becomes a nutrient source that enriches the water before it reaches the orchid plant. The major source of nutrients, however, is probably the slow decomposition of organic matter (both flora and fauna) that accumulates in tree crotches and among the bark, roots, rhizomes and leaves of orchid plants.*

Epiphytic orchids have adapted to ecological constraints with unique mechanisms that tap limited resource pools, prolong contact with passing canopy fluids and promote water and nutrient use efficiency. Epiphytic orchids have adapted to the water deprived and nutrient deficient environment by growing more slowly, producing leaves that are thick and hard, and putting more energy into root formation. Air movement is greater in the tree canopy, drying leaves rapidly after storms, which helps prevent bacteria and fungi from penetrating into the plant. Orchids require more fertilizer in culture, thanks to the loss of roots each time they are repotted. Thanks to their inherent ability to take up nutrients, they can be pushed to grow more rapidly with lots of fertilizer, but rapidly growing cell walls may be thinner and softer and more easily invaded by pests and diseases. Rather than relying on a chemical arsenal to cure problems, prevent problems from occurring by mimicking nature. Abundant air movement, dappled light, open freely draining potting mixes, dilute fertilizer and careful watering will help you grow healthy plants, which will reward you with lots of blooms.

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Citations and Additional Reading

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