

# *Orchids*

*IN NEW ZEALAND*



Volume 15-No. 5  
September/October 1989

1889-1989 — 100 Years of Cymbidium Hybridising



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# Orchids

## IN NEW ZEALAND

incorporating 'The New Zealand Orchid Review'

OFFICIAL PUBLICATION OF

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NEW ZEALAND ORCHID SOCIETY

**VOL. 15 No. 5**

**SEPTEMBER/OCTOBER 1989**

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## FRONT COVER

*Cymbidium* Tom Thumb x *Claudona*. A delightful example of  
modern small cymbidium breeding, recently registered by  
Geyserland Orchids as Desert Gem:

Grower: Geyserland Orchids    Photographer: A. Patterson-Kane

## BACK COVER

*Corybas macranthus*, *C. acuminatus*

Photographer: Bob Goodger

## **EDITORIAL Orchid Friendships**

The Orchid Council of New Zealand has declared 1989 as 'Orchid Friendship Year'. Most of us, as we get into orchid growing (or most hobbies, for that matter) find that we make good friends along the way. This is, of course, one of the best 'spin-offs' from the pleasurable pursuit of growing nature's greatest floral creations.

However, a particular aspect of 'Orchid Friendship Year' is the emphasis on welcoming newcomers to the orchid scene. Cast your mind back to your own first appearance at an orchid society meeting (now fast receding into the mists of time, alas!) Probably you felt rather diffident and ignorant, and were grateful for any smile or friendly remark that came your way. Why not extend the hand of friendship at YOUR next orchid society meeting. Make an extra effort to encourage new members who joined at Spring Shows to attend your more informal pre-Christmas meetings. You may discover yet another friend. And of course, next year in Auckland we hope to see many friendships flowering!

This is our last editorial. To the new Editor(s) we extend our best wishes for the future. To all those who have supported us with written contributions, photos, donations, or advertising, many thanks. And to all of our readers, many happy years amongst your orchids, and we hope to see many of you at the 1990 World Orchid Conference.

**Elizabeth and Nick Miller**

## **Native Orchid Weekend 1989**

The Taupo Orchid Society is planning to hold its 7th annual native orchid field days on the weekend of the 9th and 10th December. This year two separate trips are proposed. On Saturday, 9th December, the first part of the Kawakawa Bay walking track will be investigated. The meeting place is at the Kinlock Store at 11 am — bring a lunch and firm shoes . . . togs for a swim if its hot!

The Kawakawa Bay walking track has a large number and variety of native orchids along its length and should provide an interesting contrast to the Sunday trip to the Iwitahi native orchid reserve in the Kaingaroa pine forest. The walking track has several small hills and includes a walk along the lake shore. It is not strenuous but a moderate degree of fitness is desirable.

On Sunday, 10th December, those people going to Iwitahi will meet at the Taupo District Council car park (lake front adjacent to the fire station) at 9am or at the Iwitahi Outdoor Education Centre Camp at 9.45am. Bring a lunch and something to drink.

The native orchid weekends have proved very popular in the past and we hope this year's field days will be no exception. The trips are open to everyone and we hope to see some familiar faces as well as some new faces.

The Taupo Orchid Society will host a BBQ on the Saturday evening and will provide the meat if those attending bring a side dish eg a salad or similar. Also bring your own plates, cups and cutlery. An indication of the numbers attending would help with catering.

For further information and those intending to come to the BBQ please contact either

**Doug Mitchell (074) 86-993 or Max Gibbs (074) 85-024, 15 Rahui Street, Taupo.**



# That Questionnaire

Those of you who spent some time answering the recent 'Orchids in New Zealand' questionnaire will be wondering what it revealed. Your Editors finally analysed the results—it was the sort of job that tended to get put off as preparing the magazine was more urgent and some interesting trends emerged.

We had a total of 635 responses, 40% of these being male, 57% female, and the balance apparently hermaphrodite. The great majority (86%) were over 40 years old. Those ladies who refused to give their age were not given the benefit of the doubt!

Most of those who responded were subscribers to 'Orchids in New Zealand' (72%). Most (85%) owned a greenhouse or shadehouse. Only 22% subscribed to any other orchid magazine, but 59% regarded orchid growing as their main hobby.

Nearly half (44%) of respondents grow more than 5 different genera, and only 9% stick to one genus—no prizes for guessing which one.

The main genera grown, in order of importance were *Cymbidium* (76% of respondents), *Dendrobium* (34%), *Cattleya* (26%), *Phalaenopsis* (11%), *Paphiopedilum* (10%), *Odontoglossum* (4%) and *Masdevallia* (4%).

Most growers do not spend large sums on their hobby, with 48% spending less than \$200 per year, 14% spending more than \$500, and the balance falling between these extremes.

Our subscribers had some clearly indicated opinions about the magazine, some 83% being reasonably happy with it. A similar percentage (87%) thought it was good value for money, and very few (6%) would prefer a cheaper magazine without colour. Almost all (96%) read the advertisements, but rather fewer (65%) bought plants or other goods through them. Only 33% of our readers bought plants by mail order, and were not always satisfied with the quality that they received.

The most popular cost-cutting options for 'Orchids in New Zealand' were to put up the price and retain/increase the quality (62%) or to publish quarterly (50%). Very few (4%) wanted a smaller magazine, with little or no colour.

Apart from those avid readers (68%) who read the entire contents, the topics favoured, in order of importance, were orchid culture, greenhouses etc., orchid collecting, orchid society activities, personalities of the orchid world, native orchids (an encouragingly high further 22%), orchid history, breeding or orchids, 'other topics', technical topics and orchid judging (bottom of the list with 9% extra).

Of those non-subscribers who filled in the questionnaire at orchid society meetings, only, 33% had ever subscribed to 'Orchids in New Zealand'. The main reason for giving up the subscription were the expense and 'forgot to re-order'. Hopefully, a large number could be tempted to subscribe by various measures.

As a final comment, the clear impression came through that our subscribers, in general, had a much more positive and cheerful outlook than our non-subscribers. So there you are—subscribe to 'Orchids in New Zealand' and improve your psyche!

*Editors*

## Closing Dates

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# Orchid Ramblings

*Bob McCulloch*

Well, the last flowering season before the 13th WOC (that's the World Orchid Conference) is over now, and you should be making plans for next year based on what happened to your plants this year. I must say that I am a little disappointed with the WOC (that's the Weather Organising Committee); if I knew who they were then I could refer them to the *Cymbidium* guide published by the WOC (that's the Wellington Orchid Society—I wish they had called themselves a club). Obviously they (that's the WOC of the WOC) want to remain anonymous in order to protect the guilty if things go wrong, but the guide states quite clearly that the winter weather in the typical *Cymbidium* habitat is cool, dry, and sunny. Did your area get this type of weather last winter, because mine certainly didn't, in fact it was the usual sort of winter with perhaps a few more frosts than normal. It seems that the usual pattern of a sunny day following a frost has altered to a cloudy day which is cold and bleak; maybe this has something to do with the greenhouse effect. Perhaps the WOC of the WOC could have a look at this while they are at it. At any rate, there is another year to go so perhaps they will get it right when it counts.

You should already have broken off all your spikes and be feeding up your *Cymbidiums* to get the biggest bulbs ever. Don't put them outside until the weather is really warm; they will grow better in the glasshouse until the weather gets warmer, and if put outside then will continue to grow without the check which they would suffer if put out when it is still cool. Give them plenty of water when they need it, which might be anything from once a week to every two days. Don't let them dry out and don't get them waterlogged—somewhere in between so that they grow steadily instead of in fits and starts. Fertilise regularly with a variety of brands. I believe plants are very much like human beings, they get tired of the same food all the time. Give as much light as they can take without burning the leaves—a nice pale yellowy-green is about right. Beware of sunny spring days; I burn my *Cattleya* leaves without fail every year because I don't put shading on until it is too late. Of course as soon as I see the burned leaves, I remember, and vow to put shade on earlier next year. *Cymbidium* leaves don't burn so easily—they aren't as thick as *Cattleya* leaves and seem able to get rid of the heat more quickly, but some shade from the end of August will keep your mind at ease if a rainy day turns sunny while you are at work.

My original collection of orchids was mainly standard *Cymbidiums* flowering from September onwards, but due to the increasing availability of intermediate and miniature *Cymbidiums* with a flowering time from May to December, I don't have such a great number of plants which will flower for the Conference. This means they can get individual attention and the rest can look after themselves for a while. (Actually, last year was the Year of the Paintbrush, and they all looked after themselves over the summer. They managed quite well without me fussing about, just a few spots of paint on the leaves, which leave virussy looking marks when they are scrapped off—very exciting until you realise what has caused the marks!)

Until now I have flowered all my *Cymbidiums* in the same house. This is all right for the reds, yellows and dark colours, which appreciate as much light as they can get, but it makes the greens go a sickly yellow and the whites get a pink tinge. (There are some "non staining" whites around which don't go pink, but none of them are in my collection.)

Some years ago I visited a grower who specialised in fluorescent greens and glistening whites. His flowering house was an old garden shed with a couple of pieces of Novarroof in the roof,

and one very dirty window. It was almost necessary to switch on the light to see the plants, and they stayed there from the time the buds started to come out of the sheath, with no water, no heating and virtually no light. It's worth trying, but don't keep them in your garage if you will be running the car engine in there, as the exhaust fumes cause the buds to go yellow and fall off, and flowers to wilt very quickly.

I have recently become interested in growing *Cym. devonianum* hybrids, and several have flowered this year for the first time. To my eyes they are captivating, and the strong influence of *Cym. devonianum* which gives small bulbs, broad leaves, and pendulous spikes of small dark flowers is fascinating to see. It is very rarely that the other parent gets a look in, and when two devonianum hybrids are crossed, the resulting flowers are so small they can hardly be seen without a magnifying glass.

Strangely enough, *Cym. devonianum* is only miniature above the ground, it has roots very much the same size as a standard, and this leads to small plants in what looks like pots which are too big for them. If well grown, they are a glorious sight with spikes cascading down on all sides of the pot, and then they look more in proportion. I have found them more difficult to grow well than other Cymbidiums, or perhaps I mean to say that their culture is a little different. They need plenty of water and fresh air during the Summer, but as soon as you suspect that the plant might be thinking of putting out a spike, stop watering and put it in a warm dry place. No more water until it has finished flowering or the spikes will rot off, or worse, change into growths which then rot off and leave the plant without something to grow from next year. There are a few devonianum hybrids which I bought as flowering plants and have slowly shrunk to the size of seedlings. But given the extra heat (say intermediate) and kept dry no matter how thirsty you think they must be, they

put up (or more usually down) spikes which are remarkably big for the size of the bulbs. Even when the other parent has strong enough genes to have some sort of influence on the flowers, they are usually smaller and darker, and instantly recognisable as having devonianum breeding.

However, a major difficulty arises when it comes to transporting a plant with pendulous spikes from Wellington to Auckland without losing half of the blooms. It must be possible, but it's not the same as putting stakes in the pot and lashing the spikes to them. The only tentative solution I can think of is to build multi-storied holders with lots of vertical bits that the spikes can be tied to. Can anyone let us know how they do it? It's a lot simpler with upright spikes: for short distances you get hold of one of those expanded polystyrene containers that carboys are transported in; each one will hold four medium sized plants, or one large one if you cut out the divisions. Yes, I know they mess up the ozone layer, but they are going to do that whether you make use of them or not, and even if the material is replaced with something else in the future, it will still have the same features that we are looking for.

I have watched commercial growers unpacking their vans before a show, and packing them afterwards. There is probably a method in what they do, but it seems as if they just put plants in until there are so many that they can't fall over or even move, and then they put another layer on top. For the few plants which I take to shows, I use tomato boxes with wooden struts nailed to the base to prevent the box from tipping over. If you measure the space in your wagon (every serious orchid grower has at least a wagon, and preferably a van) you can work out how to stagger the bases to get the maximum number of boxes in the space. Newspaper is packed around the pots, and spikes supported firmly with many stakes. Large flowers may need to have the lips supported with cotton wool to prevent

them becoming detached, something which always makes me very cross.

Maybe you could spend the odd weekend loading up your wagon and driving a few hundred kilometres, then unpacking everything again to see how

it survived the trip. I am sure it would pay dividends in the quality of the plants on your Society's display at the 13th World Orchid Conference. ◀

18 Davis Crescent  
Upper Hutt

## OBITUARY

### LEWIS (LEW) WYATT

Lewis Wyatt, President of the Capital City Orchid Society, died on 26th July 1989, after a short illness. He was 64 years of age.

He emigrated from Cheshire in the United Kingdom on the '*Captain Hobson*' in 1953 living initially in the government hostel at Trentham. In 1960 he joined the DSIR Physics Laboratory and in 1974 the Institute of Nuclear Sciences where his training as a machinist assisted him in the development of a modern highly efficient engineering workshop. He always strived for ultimate perfection and passed his skills to many others who associated with him through the years. His hobbies were stationery engines, tropical fish and music until a neighbour introduced him to the local council glasshouses and orchids.

In the early 1970's he joined the Hutt Valley Orchid Circle, sharing the knowledge of it's older experienced members, and became its secretary. He became the foundation secretary of the Wellington Orchid Society and held that position until all the formulating problems were resolved. He joined the Capital City Orchid Society when it was founded and was in his third year as its president this year. He belonged to other societies also, including Kapiti and Taranaki, and the recently formed Masdevallia Group.

Lew was appointed as a Judge by CONZED in 1977 and grew and regularly displayed a wide range of orchid genera in flower at Wellington Society meetings each and every month. He shared his extensive knowledge and plants freely. In 1982/83 he joined the planning committee of the 1985 Second New Zealand International Orchid Conference as its Show Marshall. Although he received extensive help from many others, the responsibility for the smooth running and presentation of that magnificent orchid extravaganza rested right on his shoulders and he did it well, despite the fact that his health was slowly deteriorating.

Lew did everything well, including his orchid houses and his orchids. He was always nice—always immaculate—always kind and pleasant. He would share and help everyone with knowledge or plants, and he knew how to get on with people, the most important thing.

Lew Wyatt, the orchid fraternity of New Zealand will miss you immensely.

Doug Patchett  
President  
Kapiti Orchid Society

## 23. AUGUSTUS HAMILTON (1853-1913)

Ian St. George

Augustus Hamilton was born in Poole, Dorset, and attended Epsom Medical College. He had a leaning toward natural history, however, and in 1875 came to New Zealand, to Thorndon, Okarito, and Petane in Hawke's Bay. There he became secretary of the Hawke's Bay Philosophical Society, and founded the Hawke's Bay Museum.

In 1890 he was appointed Registrar of the University of Otago, and over the next thirteen years in that position, did his most productive work. He wrote over seventy papers for the *Transactions of the New Zealand Institute* on botany, zoology and ethnology. Skinner wrote of him:

"The range of Hamilton's knowledge was remarkable. At one time or another he wrote papers of value on almost every branch of natural science . . . He was, above all things, a collector and systematiser, whether as a zoologist among the bones at Castle Rocks, or as a botanist in the wilds of southern Westland and on Macquarie Island, or as the gatherer of his unrivalled collection of New Zealand stamps, or, most of all, as a collector of objects throwing light on the life, industry, and art of the ancient Maori."

The minutes of the seventh meeting of the Otago Institute on 14th November 1893 (the year he came to Dunedin) record a sample of his variety of interests. Dr Hocken was in the chair. Among the eight communications were three from Hamilton —

"Mr Hamilton laid on the table a continuation of his paper in the *Transactions* of last year on the fissure at Castle Rock, and exhibited the series of bones of the male and female of *Harpagomis* lately recovered by him from the fissure. Mr Hamilton also laid on the table notes towards a bibliography of the Moa. Mr Hamilton showed six kinds of living terrestrial orchids found growing in the neighbourhood of Dunedin."

Donald Petrie found *Gastrodia minor* and wrote of the new plant in 1893:

"*Hab.* Town Belt, Dunedin, in shady manuka bush. Flowers first week of January. The present species differs from *G. cunninghamii*, H.f., in its small size, short racemes, smaller flowers, and umber-brown colour, but most of all in the structure and attachment of the labellum. Mr A. Hamilton has kindly drawn for me the flowers of both species, and his drawings show the points of difference plainly enough."

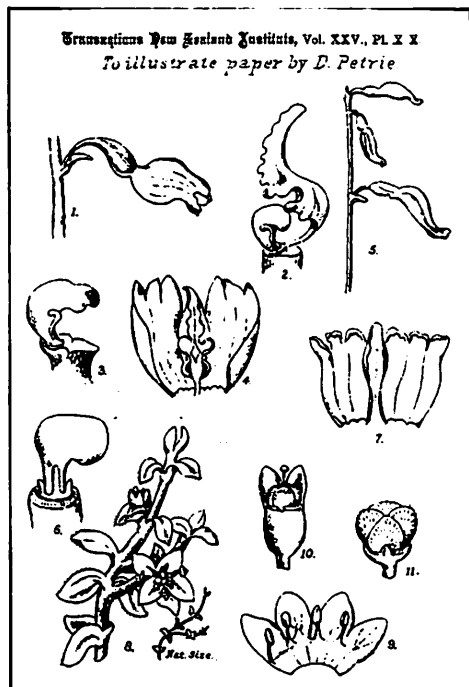


Plate: engravings of *Gastrodia cunninghamii* (1-4), *G. minor* (5-7) and *Tetrachondra hamiltonii* (8-11) by Augustus Hamilton, to illustrate Petrie's original description of *Gastrodia minor*. *Transactions of the New Zealand Institute*, 1893; 25: 273.

Hamilton's drawing is shown in the plate. He illustrated a number of his own papers thereafter. He exhibited with the Otago Art Society while in Dunedin, with the New Zealand Academy of Fine Arts, and showed views of Mount Cook at the Otago Industrial Exhibition in 1898.

He was an avid collector of artifacts in Hawke's Bay and Otago. But his great work was in the field of Maori art: he made explorations all over New Zealand recording examples of carving, weaving, rafter patterns and rock drawings.

Hamilton was appointed Director of the Dominion Museum to succeed Sir James Hector, in 1903. The Museum acquired his collections, and in 1907 his monumental work *Maori Art* was published by the New Zealand Institute in a limited edition of 900 copies. It was of 445 pages with 281 illustrations, and contained coloured lithographs of rafter patterns.

When he died in 1913 he had been Governor of the New Zealand Institute, a member of the Maori Mission Board, founder of the Polynesian Society, a member of the Council of the New Zealand Academy of Fine Arts.

His colleagues at the New Zealand Institute subscribed to a memorial for him at Russell. The bronze plaque at its base has an inscription in Maori which reads,

"This European Hamilton was a firm friend of the Maori people, a person who treasured their old-time works and ancient lore. Hence he was named Tupai te Ahorangi — the core of the House of Learning, the Preserver of Occult Knowledge."

45 Cargill Street  
Dunedin



## PERILS OF PESTICIDES

*We do not normally reprint articles from society newsletters, but include the following extract from the Tauranga Orchid Society Newsletter, as it is important that we are informed or reminded that chemicals poisonous to plant pests and diseases are very often poisonous to humans as well. There's no room for "She'll be right, Mate!"*

Sheryl Grouwstra worked in an orchid nursery but did not actually do any of the spraying. However, she was in contact with the residue on the plants in the course of her work on the days following spraying. At that stage no special precautions were taken and short sleeved tops and bare legs were the order of the day. Stringent rules have since been enforced. Sheryl had the following symptoms and after some time was diagnosed as having Organo-phosphate poisoning. Headaches (became 4-7 days in duration and very severe), tiredness (became total exhaustion), nausea, dizziness, excess salivation, muscle cramps, runny nose, diarrhoea, feeling cold, excess perspiration, loss of appetite (the sight of food or the thought of eating made her nauseous), weeping eyes, shaking (became very bad for a while—uncontrollable spasms), loss of memory, swelling in fingers, difficulty in breathing (at times walking a few yards was too much), slowing of heartbeat and blurred vision (some days very bad, unable to read).



Leaving the workplace did not mean an immediate improvement. The organophosphates accumulate in the body and are slow to leave. Once they have left the body (in Sheryl's case about 14 months), then the body begins to heal and return to normal, but symptoms can recur at any time. The effect was totally debilitating, both mentally and physically. Organophosphates reduce the level of Cholinesterase (an enzyme) in the body and thus affect the nervous system. Some functions work overtime, the muscles in the body are slowed down, e.g. heart and lungs.

Recall of memory became quite bad and frustrating, she says, "one day I could not remember how to turn on the wiper blades of a car I had driven for 8 years". Heartbeat slowed to the point where she was on the verge of passing out or continued for so long, 40 minutes, it was very frightening.

She was warned that she was unable to have general anaesthetics at all, but found that even local anaesthetic (dentist) worsened tiredness and symptoms, when just on a general improvement. She has been told that it will be 2 years before she is herself again. At times the body went into overdrive and could not sleep. She could not drink alcohol.

Sheryl says "It is only in the past month or so that I have begun to get my personality back and am able to do the things we all take for granted—like vacuuming the house without being totally depleted afterward!"

Thank you Sheryl! This is not scaremongering but something that can happen to anyone, hence this full report.

Health Dept. leaflet 4205 recommends blood tests for those using Organophosphates regularly. These are the pesticides they list:- Orthene, Gusathion, Nexion 40, Trithion, Lorsban, Metasystox, Dyzol, Gesapon, DDVP, Vapona, Rogor, Disyston,

Ekamet, Nemacur, Verthion, Basudin, Dyvos, Dasanit 10G, Malathion, Supracide, Phosdrin, Gramothion, Dibrom, Folimat, Folidol, Thimet, Imidan, Tokuthion, Afugan, Ekatin, Dipterex, Lepidex, Nuvan and Tamaron.

These are some common brand names of organophosphates. So, always read the label, cover your skin, wear a respirator, keep yourself clean and use clean protective equipment.

Dr Bob Chalmers explains how the enzyme mentioned, works. The "voluntary" nervous system and most of the "involuntary" nervous system work by releasing a chemical (Acetylcholine) at the nerve ending and it is the Acetylcholine that acts on the target organ and makes it work. An enzyme called Cholinesterase then destroys the Acetylcholine. Otherwise the target organ (muscle, salivary gland or whatever) would continue without stopping. The organophosphates destroy or prevent the cholinesterase from working. The effects are as Sheryl listed. Other symptoms are—pinpoint pupils causing blurred vision, abnormal heartbeat, lowered blood pressure, excess mucus, "fluid on the lungs" i.e. the lungs are water-logged. So there is too little oxygen in the blood. Colic, vomiting, urinary frequency, incontinence, muscle twitchings, tremulousness, lack of co-ordination, muscle weakness, paralysis; anxiety, emotional instability, lethargy, confusion, severe central nervous depression and coma.

These pesticides are dangerous and must be treated with respect.

Health Dept. leaflet 4206 gives a very full coverage of protective measures for people applying pesticides. May we add that this applies to people who may be in contact after spraying has taken place, as the poison is so easily absorbed through the skin. Gloves and long sleeves are a must, and clothes worn should always be washed separately. ◀

*Tauranga Orchid Society*

# Cogito's Diary

*Bill Fransen*

## RETROSPECTION

Someone recently presented me with three volumes of thirty year old 'American Orchid Society Bulletins' and quite a few issues of our old 'New Zealand Orchid Review' (the precursor of 'Orchids in New Zealand') of about the same vintage. I wasn't quite sure whether or not to be pleased. Storage space in our house is running at a premium, as for orchids in the greenhouse.

I enjoy reading through those old magazines. They are real treasure troves that contain untold "current today" case histories and contributions from now legendary identities such as Dr Robert Dressler, Ernest Hetherington, H. Kamamoto, Emma Menninger, Masatoshi Miyamoto, W. Moir, Georges Morel and Rebecca Northen, to name just a few. The old issues of the 'New Zealand Orchid Review' also contain many impressive accounts of the personal experiences of people now prominent (or still) in the New Zealand orchid world. Many of the early contributors of copy don't seem to bother anymore. I wonder if it is because they feel that it has all been said before?

When looking at it from that angle, an amateur like myself may justly ask himself what on earth he thinks he's up to. My ravings are retrospective in the sense that they mostly give an account of recently passed events, experiences, thoughts and interpretations. That approach was chosen in preference to trying to synchronise events in the greenhouse with those that prevail at the time of publication. Both approaches have merit. The treatment of recently passed events has the advantage that everything is still fresh in the mind. The disadvantage is that it can be classed as "old hat" by the time it is read.

I prefer reading articles that discuss day to day happenings. Many topics remain actual and go full circle, even after thirty years. Some subjects re-appear every few years or so, often highlighting slightly different aspects. An inherent characteristic of retrospection is that mistakes are made

before they come under discussion. The advantage of that is that a sharper lesson is learned and that the surrounding arguments are more easily accepted. It may however take a full year before the same set of circumstances re-occurs. The fact that topics recur in cycles indicates a need. Not everybody keeps or reads old magazines. No one article or book is ever totally complete in all the intricate aspects of the subject it treats. Different people have different approaches and use fresh angles.

The last but not least reason for contributing to 'Orchids in New Zealand' is that our Editors are not yet being embarrassed with a flood of manuscripts, so on we go.

## LIGHT & TEMPERATURE RELATIONSHIP

There is a clear relationship between the amount of light that enters a greenhouse and the temperature that the air inside it will build up to without artificial heating. Other factors such as humidity and air movement have an influence also but are left aside in the meantime. Unless one belongs to the lucky few to whom power bills are of no particular note this "greenhouse effect" is used to full advantage during winter. In summer we can moan about it and try to do the opposite, i.e. minimise its effects.

Things are rarely clear cut. Usually a compromise has to be struck. There is the desire to attain the maximum of "natural" heat by allowing in more light by removing shade cloth or shading paint during winter. On the other hand there is

the wish to maintain low enough light levels so that flowers don't fade. In mixed collections the clash of what's desirable becomes more pronounced.

The above is the theory. During the month of May this year I gradually came to the conclusion that my cool house remained considerably cooler than at the same time last year. In both cases I'd left the 30% shade cloth "on". The only thing that was different was that I had raised the shade cloth 15cm above the twinwall roof by inserting a wooden frame. On closer consideration those wooden frames produced their own shade. There now were 36 lengths of 25mm square timber running across the width and another 14 ditto along the full length of the roof. With the sun being lower in the sky (May) that probably doubled the shading effect of that timber when compared with mid-summer. Furthermore a thin film of dust was now nurturing a thin layer of algae that wasn't there in May last year. A child could see that the degree of shade had more than doubled! This at a time that the light levels are lower and the length of daylight much shorter than in summer.

I am incapable of working out how much shade increase the above factors really amounted to when comparing with mid-summer but it must be considerable. Once I realised what was going on, that shade cloth was whipped off in no time. It had to come off anyway because the ventilating aperture in the top of the East wall had to be closed for the winter (twinwall sheets replaced). With due application of elbow grease I next set to handcleaning the West-wall sheets. A bucketful of warm water with a tablespoon of Physan did it nicely. The effect was remarkable. That West wall developed a nice shine and far more transparency than I could remember it ever had. I decided to carry out a little experiment. I mixed 10 mls of Physan in one litre of water and used it to spray a 1 metre wide strip of dry roof over the full length of it. The next day I hosed it down. The algae were gone but a

greyish film of dust with much better transparency remained.

Because of the nearness of a shed and a fence, my cool house is shadier in the northern half. I find that quite handy because it enables me to give shade loving plants what they require. The plants in that area can well do without the extra shade provided by algae, particularly during winter. Another fine afternoon saw me on the roof with bucket and mop, gingerly moving around on hands and feet on the places where the pipe framing gave best support. That half of the roof now also has that clean look. I feel quite certain that most housewives in the neighbourhood would now employ me as a window cleaner. I left the remaining algae on the southern half of the roof as I think that it can do with that moderate amount of extra shade. Over-all the extra light had the immediate effect of raising the average temperature by 5 to 6°C.

An important contrast was highlighted by Mr Clive Hall in Rotorua recently. In a talk on *Odontoglossum* culture in Australia he also showed an interesting series of slides. A couple of these showed his greenhouse, temporarily covered in dense scrim cloth. Combined with heavy damping down this strategy helped to lower the heat of a 45°C plus heat wave.

## DENDROBIUM LEAVES

With the exception of the native Australian *Dendrobiums* most other kinds can be said to possess "touchy" foliage. There are warm, intermediate and cool growers. As in most other genera, perfect foliage can be grown if we stay within the ranges of required rest, temperature, humidity, light and mineral needs. Many *Dendrobiums* have an amazing ability to survive less than ideal conditions, but the price has to be paid, usually in the form of tatty and prematurely aged leaves.

Early last summer a visiting friend looked at the foliage of my *D. thysiflorums* and asked if I knew what



caused it to go tippy and yellowish. His were affected in the same way. Except for a guess I could not tell him the reason. Since then, the question has had me pondering on a number of occasions. The answer is not simple or straightforward. *D. chrysotoxum* and *D. densiflorum* are in the same league. There are other matters as well. New leaves of *D. thyrsiflorum* tend to have difficulty in sliding out of their surrounding leaf sheaths. They tend to remain folded and will buckle unless manually released. Still another aspect is that the leaves must be very tasty. If there is a chewing insect, caterpillar or snail around, it will target *Dendrobium* foliage in preference to any other.

*D. thyrsiflorum* is an intermediate grower. I regard my cool house to provide "almost intermediate" conditions. To allay extremes of heat and cold I should really apply more cooling or heating, as the case may be.

Having no specific "intermediate" house the intermediate growers finish up in either the warm room or the cool house. *D. thyrsiflorum* tends to flower in an irregular fashion when housed in the warm room so it ended up in the cool house. Intermediate and warm growers are more subject to fungal attacks when exposed to lower than optimum temperatures. If those temperature lows become greater or last for longer periods

the plants react first by leaf yellowing and next by premature leaf drop. The plants survive alright. The canes remain strong and healthy if the roots do. Flowering will take place as normal but I feel that care is needed because the loss of leaves really signals the onset of reduced vigour.

*Dendrobium* roots need plenty of air at all times. Most of them do alright in pots but I take care to keep them dry in winter, especially when exposing them to more cold than they should have. Poor root systems **also** make for a reduction in vigour and will affect the plants in the next growing season. Those touchy leaves may therefore have more than one good reason for their apparent fickleness. Moderate feeding can easily become excessive when some part of a plant is not up to scratch. Tippyness and yellowing are warning signs.

Most *dendrobiums* like a fairly high relative humidity but only when the temperatures are in their optimum range. Nearly all orchids thrive in high humidity if ideal temperatures and air movement are maintained. The leaves of most *Dendrobiums* will stay on the plant in good order and condition if they are kept thriving and vigorous in all their parts and in a clement environment. Make-do tactics make for make-do results!

The month of June was the mildest on record by up to 1.5°C above average. The first week of July produced a solid week of frosty mornings. That way we experienced in one lump what was spread out over all of the previous winter (mainlanders will be jealous at even that). Temperatures in the cool house sank to well below what I regard as my normal 8°C low. *Epidendrum radicans* kept flowering without ill effects only millimetres away from the twinwall sheets. Cymbidiums and most other things showed no stress except those true intermediates. Quite a few *Dendrobium* leaves did drop while others remained unaffected. That applied to the softcane dendrobiums as well, even side by side plants showed a variation in their reactions maybe according to the sensitivity of their ancestors. The canes and buds remained O.K. Even though the softcanes are cool growers their cool should not be lower than 6 to 8°C ideally. "Cool growing" is a relative term. An occasional drop in temperature is easier to cope with than a sustained period.

Enjoy the balmy days of spring.

6 Wedgewood Place  
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We are all always most appreciative of support for the coloured illustrations in the magazine. Thanks to all who have helped in this way.

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3. —

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# MASDEVALLIAS — The Species

## PART 4

Russell Hutton

No, our 'Masdevallia Magic' weekend did not dull my enthusiasm for these orchids, in fact quite the reverse. Having got more or less 'back to normal', a phrase with forgotten meaning around here, I have found a little time (it's now 3 am) to put a few words together to send off to the Editors, so let's have a look at some dainty dwarfs from the Sub-Section *Oscillantes*.

The species belonging to this group are all miniatures with plants only a few centimetres tall in some instances. The leaves are deep green, often with blackish stems, and rather broad and paddle-shaped. The species all come from moist cloud forests and from my experience grow very well in cultivation, preferring a shaded situation in an intermediate house. The distinguishing feature of the sub-section *Oscillantes* is the very motile lip which will bob up and down at the slightest provocation. Although the plants are quite small, indeed tiny, their flowers are usually proportionately large and colourful. They have a rather 'cheeky' look about them which I find most appealing. The 12 or so species concerned are all from Southern Ecuador and Northern Peru with the exception of two deviants from Colombia and Venezuela.

### **Masdevallia citrinella**

What it would be to see these little freckled faces peeking at you from moss covered branches of Southern Ecuadorian forests. More or less circular in outline, these long-tailed flowers are light yellow speckled with red and held just clear of the leaves on erect to arching stems. For us the plants bloom variously throughout the year with more flowers during late summer and autumn. Dr Carlyle Luer described this species in 1981.

### **Masdevallia persicina**

Another species relatively new to cultivation was described in 1978 and is a native to the cloud forests of Southern Ecuador. The attractive little plants have very rounded leaves and give rise to lovely sparkling long-tailed flowers in shades of pink to peach. The active little

lip is bright red. Keep this one moist and shaded in intermediate temperatures.

### **Masdevallia pteroglossa**

For those who don't know, the 'p' is silent as in swimming pool. Being only 2 to 4cm tall this is one of the smallest of the group with the tiny rounded leaves tightly clustered forming an attractive plant. Not only is this species one of the smallest, it is also one of the cheekiest with the finely speckled flowers winking like roguish pixies above the plant. *Masdevallia pteroglossa* is endemic to the wet forests of the Western Cordillera of Colombia.

### **Masdevallia rodolfoi**

This species has now been divided into two sub-species. *Masd. rodolfoi* sub-sp. *rodolfoi* and *Masd. rodolfoi* sub-sp. *ortalis* which has broader flowers with longer tails. Although *Masd. rodolfoi* is not common in cultivation it is not uncommon in wet forested regions of Northern Peru where it occurs as an epiphyte on moss-covered branches. The plants form a neat clump and thrive in intermediate to cool greenhouse conditions. Showy long-lived flowers are borne on horizontally inclined stems around the plant.

### **Masdevallia rubiginosa**

First discovered in 1978 in Northern Peru growing in wet cloud forest and later in similar conditions in Southern Ecuador. Similar in some respects to *Masdevallia rodolfoi* but with the flowers more richly coloured, being rusty red and held horizontally in the manner of many *Draculas*. For this reason the flowers can be seen to best advantage if the plants are grown in small suspended pots.

## Masdevallia wagneriana

We don't have a photograph of this lovely little Venezuelan species and to my knowledge there are not yet plants of it in New Zealand. The soft yellow flowers have long tails, are finely dotted red and maroon and are some of the largest in this group. Neat compact



*Masdevallia citrinella*  
Grower: L. & R. Orchids

All photography:  
Val Bayliss

*Masdevallia pteroglossa*  
Grower: Val Bayliss



*Masdevallia rubiginosa*  
Grower: L. & R. Orchids



plants give rise to erect stems which hold the flowers nicely above the foliage. This species should be grown in a moist airy situation in an intermediate greenhouse.

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Walter T. Upton

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Walter T. Upton became interested in orchids during his childhood in England, but it was not until he came to Australia in 1950 that he was able to pursue in earnest a career with orchids. He is a well known breeder and hybridizer of orchids, particularly Australian native orchids within the genus *Dendrobium*.

Wal Upton was founder and foundation secretary, and is now president, of the Australasian Native Orchid Society, and is a past president of the Orchid Society of New South Wales. He was made a life member of both societies, has also received an Award of Honour from the Australian Orchid Council, and is a member of the Australian Orchid Foundation. He was chairman of the 13th International Botanical Congress Orchid Symposium held in Sydney in 1981.

He is a judge for a number of societies and gives talks regularly, both in Australia and overseas. He has written numerous articles for orchid journals and is the author of *Growing Orchids*. Together with his wife Jill he owns 'Double U' Orchids, which hybridizes fine orchids for sale in Australian and world markets.

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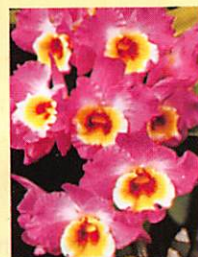
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*Masdevallia rodolfoi*

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### **Masdevallia caudivolvula**

From elfin to bizarre—*Masdevallia caudivolvula*, the sole member of the section *Caudivolvulae*. This species takes its name from the Latin *caudivolvulus* meaning 'a twisted organ' a reference to the 'corkscrewed' tails of all the sepals. *Masd. caudivolvula* is not uncommon but is restricted to localised areas of cool, damp cloud forest of the Central Cordillera of Colombia. Although the thick sepaline tails are twisted this does not occur until after the flower has opened and increases with the age of the flower as does the intensity of colour, changing from pale yellow to dark yellow. For some reason this curious species is not easy to grow in cultivation but we have had reasonable success with plants growing in a cool airy shadehouse where they are misted every half hour or so. Once the plant is established it flowers freely twice a year.

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# ORCHID TOURING IN VICTORIA and SOUTH AUSTRALIA 1988

Doug McCrae

## Part 2

### VICTORIA - Anglesea Adventure

With only a week in Victoria, there was no time to waste. An early start the morning after returning from the Bendigo tour took us through recently burned forest on the Ocean Road to Anglesea.

Near the road in dry, open habitat, similar to that in New Zealand were scattered plants of *Thelymitra carnea* which were more richly coloured than N.Z. specimens. Growing in association with them and common, were *T. flexuosa* and *T. rubra*.

Further into the Eucalypt bush we came upon a colony of hundreds of the hare orchid, *Caladenia menziesii*. Another rarity requiring fire for flower induction was *Lyperanthus nigricans*. Although the colonies were quite large, only a few plants were flowering at the time.

Lots of *Pterostylis plumosa*, with their hairy tongues fluttering in the breeze, dotted the whole area. As usual *Thelymitra ixioides* (spotted and unspotted) was encountered everywhere. *Thelymitra aristata* is a huge, robust growing orchid which was resplendent and stately with numerous deep blue flowers on a long stem. This one usually occurs as singletons sporadically throughout the Anglesea area. *T. nuda* was not uncommon.

*Calochilus campestris*, one of the bearded orchids, was seen occasionally here and provided a useful comparison for New Zealand's *C. herbaceus*.

Here, as everywhere, orchids were in abundance. Other flowering species noted included *Diuris corymbosa*, *Microtis unifolia*, *Glossodia major*, *Caladenia dilatata*, the lovely large white *C. pattersonii*, *C. reticulata* and lots of *C. carnea*. *Thelymitra pauciflora* was as common as it is in New Zealand and just

as shy in opening its flowers in dull conditions.

Everett and Margaret Foster of the ANOS\* Geelong group, were our guides in the Anglesea area. When time is limited it is most useful to have the aid of people with good local knowledge. After lunch in the park just outside town we headed up into the Otway Ranges along Forest Road. Most of the forest in the area was devastated by the Ash Wednesday fires and although fire induced species are slowly disappearing, such gems as *Caladenia menziesii* were still to be seen in good numbers.

The huge, many-flowered *Prasophyllum etatum* was the highlight of the stop. An open grassy patch was dotted with about a dozen specimens. One example in full flower was about one metre tall with a stem about 20mm thick.

The *Caladenia* hybrid *C. pattersonii* x *C. dilatata* was noted along with both parents. The pink *Caladenia* species known in Victoria as *C. pusilla* grows here and is identical with the pink orchid known in New Zealand as *C. minor*. *Pterostylis plumosa* was not uncommon, and other *Pterostylis*, *Thelymitras*, *Diuris*, *Acianthus* and our *Microtis uniflora* occurred.

After a drive of a few kilometres we reached the area known to local orchidists as the Gravel Pits. Despite being somewhat early in the season, I had my first sighting of the 'flying duck' orchid, *Caleana major*. There were quite a lot of plants but only a few flowering. Other orchids in the area were *Caleana minor* and *Lyperanthus nigricans*, the latter not flowering. The ubiquitous *Thelymitra ixioides* was there together with a few *Diuris corymbosa* in flower.

Further along this loop road we stopped in another area of forest to see

\* Australian Native Orchid Society.

*Calochilus robertsonii* again and four *Caladenia* species. Late flowering specimens of the multiflowered *Pterostylis longifolia* were a new sighting for me. *Thelymitra pauciflora*, typical *Diuris corymbosa*, together with an all-yellow form, and *Glossodia major* were evident in smaller numbers.

Observed from the car as we drove along were the stately *Thelymitra aristata* and *Caladenia reticulata* growing along the verge.

The end of the loop took us onto Gum Flat Road where *Caladenia carnea* and *C. pusilla* were not uncommon. *Lyperanthus nigricans* was here too, the large circular, fleshy ground-hugging leaves unmistakable. *Cyrtostylis reniformis* had finished flowering and there were a few bronze-coloured *Calochilus robertsonii* in flower. Other orchids noted here were *Glossodia major*, *Thelymitra antennifera*, *T. rubra*, *T. pauciflora* and the delicate *Acianthus caudatus*.

The drainage viaduct on Forest Road is home for a colony of *Thelymitra x irregularis*. Apart from the plants in the Bendigo area, this was to be the only other time I saw this hybrid in two weeks of orchiding. Along the grassy banks of the viaduct were *Thelymitras*, *Caladenias* and *Pterostylis*.

The Anglesea area is well known in Victorian orchid circles as containing some of the best habitat and range of orchids in the State. The variety of species and numbers of them again left me somewhat "orchid-shocked" at the end of the day.

## ANOS - VICTORIA GROUP MEETING

The October monthly meeting of the ANOS Victorian Group co-incided with my trip so I had an opportunity to give a short talk and show slides of New Zealand orchids. This introduction to the New Zealand orchids was well received by the meeting and I am grateful to Bob

and Beryl Goodger for the use of the CONZED native orchid slide programme while in Australia.

It was fortunate that I had the opportunity to visit the "old man" of orchids, Gerald McCraith. As you may know, Gerald is a Director of the Australian Orchid Foundation and is very active in promoting research and conservation. He manages a seed bank so that rare and endangered species can be saved from possible extinction. The Foundation also grants funds for research and other worthwhile activities likely to promote or conserve orchids.

Gerald has a couple of glasshouses in his backyard and grows a wide range of orchids. He is certainly a very hard worker in the interests and love of orchids.

## SALE AND WILSON'S PROMONTORY

Sale is a country town about 200km south-east of Melbourne.

You may think a cemetery is an odd place to find the largest known colony in Victoria of the beautiful purple *Diuris punctata*. Around 500 plants, most flowering at the time of my visit, were seen in the un-mowed grassy areas behind the tombstones. Every shape and hue enticed me to use a whole film on this one species. My most vivid memory of Australian orchids would be the sighting of this colony of the most attractive member of the *Diuris* family.

Other orchids noted in the same area were just a few specimens of *Diuris pedunculata* and *Thelymitra pauciflora*.

Wilson's Promontory National Park, 150km further to the south was the only other habitat visited this day. The 'Prom' as it is known is the most southerly part of the Australian mainland and is one of Victoria's most popular National Parks. Among the wildlife I was to see there were wallabies, kangaroos, wombats and those big black ants with nipplers! Rosellas, lorikeets and wattle birds were



often seen and heard in the unusual Banksia forest that dominated the area around Miller's Landing.

Eucalypt species were sub-dominant and there were large areas of native grasses with the odd clump of Banksia trees. The soil here, as in all other habitat visited in Victoria is quartz sand or peaty quartz.

As we walked along the 3km track towards the sea we noted *Acianthus caudatus* in seed and several Thelymitra species in flower or spike. In the tall Banksia forest were large numbers of the dainty finger *Caladenia aurantiaca*. *Pterostylis nana*, *P. pedoglossa* and *Corybas unguiculatus* in seed, and unflowered *Lyperanthus nigricans* were in the more open areas, usually at the bases of trees. The occasional *Diuris corymbosa* was seen in flower in grassy areas, with *Caladenia* species and occasional *Microtis unifolia*.

The track ends at the sea, just above which are the ruins of Miller's old house. A small island about 100m off-shore can be reached at low tide. Our timing was co-incidental and we walked across to search the tiny landmass for the two *Corybas* species, *C. incurvis* and *C. diemenicus*, known to grow there. A couple of colonies of leaves were seen but as flowering had finished their identity could not be verified.

## CRIBB POINT

This well-known orchid area is situated on the Mornington Peninsular about 100km to the South of Melbourne. The area we were to investigate was part of a housing development and consisted of grassy paddocks with a sandy, peaty loam soil alternately dry and damp. The day was sunny, but cool and windy, so few flowers of the reported nine species of Thelymitra were to be open for photographs.

It didn't take long to locate all the Thelymitra species. The numbers of unspotted and spotted *T. ixioides* were amazing. *Thelymitra pauciflora* and *T.*



*Diuris punctata*

A large colony was seen at the Sale Cemetery

Photography: Doug McCrae.

*juncifolia* were in bud. *T. rubra*, *T. flexuosa*, *T. carnea*, *T. antennifera* and *T. aristata* were flowering. The last of the nine was difficult to identify, but research later indicated a hybrid between *T. pauciflora* and *T. ixioides*.

Across the road in a large grassy area *Caladenia clavigera* was occasional and two or three plants of *Cryptostylis subulata* were seen. Victoria's most common *Caladenia*, *C. dilatata* was in flower. My second sighting in Victoria of *Prasophyllum elatum* in flower was here and there were quite a few plants of *P. patens* poking their flower heads above the surrounding long grass.

This was my last day of orchiding in Victoria. I felt almost overwhelmed by the diversity and sheer numbers of orchids seen during a week that had gone so fast.

(to be continued next issue)

112 Haverstock Road,  
Sandringham, Auckland

# GERMINATION IN THE CYPRIPEDIUM/PAPHIOPEDILUM ALLIANCE

Marilyn H. S. Light

A scientific paper presented March 26, 1988, at the Vancouver Orchid Conference.

## SUMMARY

- 1) A method to germinate pre-mature seeds of *Cypripedium calceolus* var. *pubescens* has been developed. Seeds harvested approximately 49 days after pollination, when the embryos are  $\frac{1}{3}$  developed will germinate in 14 to 21 days on a commercial medium, Mother Flask Medium IV (G. & B. Orchid Laboratories, Vista, CA) when incubated at  $20 \pm 2^{\circ}\text{C}$  in the dark.
- 2) A simple method for determining the optimum time for harvesting capsules of the *Cypripedium/Paphiopedilum* alliance is presented.
- 3) Asymbiotically raised seedlings of *Cyp. calceolus* and *Paph. exul* were shown to be successfully colonized with mycorrhizal symbionts after planting out into bark medium.

The colourful temperate ladyslippers including *Cypripedium acaule*, *calceolus* and *reginae* have attracted the attention of many investigators attempting to solve the problem of germinating the recalcitrant seeds (Arditti, 1967; Arditti et al, 1982; Curtis, 1942; Oliva and Arditti, 1984; Stoutamire, 1974, 1983; Withner, 1953). Germination of *Cyp. reginae* seed has perhaps attracted the most attention given that this species is particularly showy. Harvais (1973, 1974, 1980 and 1982) was the first Canadian investigator to approach the problem of axenic culture. He succeeded not only in germinating the seeds of *Cyp. reginae* but also in producing leafy seedlings. His death in 1982 cut short a promising research program and was a great loss. Frosch (1986) outlined a procedure to asymbiotically germinate and grow *Cyp. reginae* to flower in three years. More recently, Ballard (1987), has presented detailed results of his experiments in the sterile propagation of the same species, using seeds taken at early stages of development and at maturity. Of particular interest was his discovery that dormancy in *Cyp. reginae* seeds can be broken by refrigeration of the seeds at  $5^{\circ}\text{C}$  for two to three months prior to incubation at room temperature. He has achieved from 19-98% germination after three to four months using Knudson's "C" medium (Knudson, 1946) with seed taken 42 to 60 days after pollination.

*Cypripedium calceolus* is a particularly attractive species, native to both North America and Europe. Carlson (1940) examined the formation of the seed of *Cyp. parviflorum* to gain a better understanding of the problems involved in germination. She examined ovaries, 2-72 days after pollination, finding that fertilization occurred after 26 to 33 days. The ovaries of *Cypripediums* and *Paphiopedilums* possess two phases of growth in diameter and one in length (Duncan and Curtis, 1942). The first phase of growth in diameter takes place when the ovules are maturing, after pollination but prior to fertilization. Stort

(1984), working with the *Cattleya* alliance, has shown that unless the pollen tubes penetrate the ovary, the fruit is not formed and the ovary dries. The second phase of ovary growth in diameter is after fertilization when the embryos are growing rapidly. Duncan and Curtis also noted that the growth of the ovary almost ceases when fertilization is taking place. Muick (1978) reported the propagation of *Cypripedium calceolus* from seeds. His method seems to be symbiotic though few details were given. The report stated that blooming size plants could be obtained in three years, not 12 years as

was commonly assumed. Apparently *Cyp. calceolus* seedlings, raised in Europe, are now being imported into Canada for horticultural purposes, (Huronview Nurseries, Bright's Grove, ON: personal communication). No details as to the methods of raising these plants are available.

I first became interested in the germination of *Cyp. calceolus* seed when a friend who grows a more than 50 year old clone of the orchid posed the question, "Can you germinate the seed?". After reading the available literature, I tried to germinate mature seed on a variety of media including a commercial preparation, at room temperature, in the light and in the dark, with no success. The following year, 1986, I decided to take the seeds at an early stage of development, 42 and 66 days after pollination, as well as when the capsule was fully mature, close to the time of dehiscence, at 90 days. The flowers were self-pollinated and were all of the same clone. A new commercial medium, Mother Flask Medium IV (G. & B. Orchid Laboratories, Vista, CA), recommended for terrestrial seed germination, had become available in 1986. I prepared it according to manufacturer's instructions (final pH 5.5-5.8). Other media tested included Mother Flask Medium II (G. & B. Orchid Laboratories). The capsules were harvested at random, surface sterilized in 1:10 chlorine bleach solution for 10 minutes, opened aseptically, the seed being sown on slants of sterile media in borosilicate glass tubes (20 x 150 mm) fitted with permeable membrane polypropylene caps. Approximately 100 seeds were sown per slant. Six slants of each medium were used for each age of capsule. Slants were incubation in the dark at  $20 \pm 2^{\circ}\text{C}$  and were examined periodically. Visible germination in the form of swollen, white protocorms was evident as early as 24 days after sowing the 42 day seeds on mother Flask IV medium. Germination after three months averaged 10%. No germination occurred with any other medium tested

or with any other age of seed. Some of the protocorms were replated to Replate Medium IV (G. & B. Orchid Laboratories), a medium designed for replating terrestrial seedlings. However, the protocorms quickly turned dark brown and died. Those protocorms left on the Mother Flask IV slants in the dark grew, developing first a branched rhizome-like structure then extensive hairy roots (Jan. 1987). The plantlets were removed from the slants, 10 months after sowing (April 1987), and were planted in a pot with an adult Cymbidium. The potting medium was a mixture of redwood bark chips, leafmould, fired clay gravel and marble chips. The seedlings developed a green shoot but no expanded leaves. They received the regular watering and weekly feeding schedule of the Cymbidium and were exposed to climatic variations as the Cymbidium was out-of-doors all summer. Six months after potting, (Sept 1987), one of the plantlets was removed from the pot and examined. It appeared healthy although still without expanded leaves. The root tips showed signs of a recent growth spurt. One root was removed, sectioned with a razor blade, wet-mounted and observed microscopically for signs of mycorrhizal infection and mycorrhizal peleton formation. Williamson and Hadly (1970) showed that fungal infection can be controlled by the host; successful mycorrhizal infection is only through epidermal root hairs. They added that peleton formation is evidence of initiation of symbiosis. Hadley (1970) pointed out that root infection and peleton formation may occur with a variety of fungi and not necessarily with the same fungus that can stimulate germination of a particular orchid species. Examination of the root of the potted seedling showed that infection had occurred via the epidermal root hairs and that a few peletons had formed beneath the epidermis. These seedlings have been kept over winter at approximately  $10^{\circ}\text{C}$ .

The germination experiment was repeated in 1987 with capsules



harvested at 30, 35, 43, 49, 58 and 73 days after self-pollination. The capsules were all harvested from the same clone. This more extensive experiment was designed to bracket the stage of optimum germination and to gather as much evidence as possible to identify it. Days after pollination was an absolute figure but I was concerned that climatic variation could play a role in the rate of development of the seeds.

The capsules were surface sterilized as previously described and the seed was sown on slants of Mother Flask Medium IV. Twelve replicate slants were prepared for each age of seed. Approximately 100 seeds were sown on each slant though it was difficult to ascertain numbers of seeds with the 30 and 35 day samples; the seeds were

difficult to separate from each other. Some of the same seed was mounted in water, examined under the microscope and photographed to show the average stages of embryonic development in a test capsule. The slants were incubated at  $20 \pm 2^\circ\text{C}$  in the dark. Three additional replicates at each stage were prepared and stored for either 1, 2 or 3 months at  $5^\circ\text{C}$  in the dark, then were moved to the  $20 \pm 2^\circ\text{C}$  area, still in the dark, where they were observed at regular intervals.

One capsule of the same clone, pollinated at the same time as the others, was marked with waterproof ink at the widest point, and was measured at each time a capsule was harvested. The capsule diameter was plotted against the time after pollination.

**TABLE 1**

Germination of pre-mature seeds of *Cypripedium calceolus* v *pubescens*, with and without cold pretreatment: Results after nine months.

Days after pollination	Diameter of capsule (mm)	Embryo status		% Germination*
		Integuments	Embryo	
0	4	Not studied		—
30	8	Visible		0
35	11	Elongated		0
43	11	Final size	3-celled	1
49	13		8-12 cells	50-75
58	14	Darkening	Final size	5-50
73	14	Collapsed	Mature	0
110	not measured	Capsule dehisced		not studied

\* : 12 replicates, approximately 100 seeds/slant, on Mother Flask Medium IV (G. & B. Orchids, Vista, CA) at  $20 \pm 2^\circ\text{C}$ .

Essentially no germination was seen in triple replicates stored at  $5^\circ\text{C}$  for the first one, two or three months, and subsequently held at  $20^\circ\text{C}$ .

The results of the 1987 experiments are summarized in Table 1. The first signs of germination were observed 18 days after incubation of the 49 day seed at  $20^\circ\text{C}$ . Germination averaged 50%-75%, varying widely among the replicates. Seed taken at 58 days after pollination began to germinate in just 8

days (5-50% germination); however since that time most but not all of the protocorms darkened and ceased growth. They were not necessarily dead, however, since a few of the darkened bodies have resumed growth several months later. The 49 days after pollination seeds showed immature

embryos,  $\frac{1}{3}$  developed, consisting of approximately 9-12 cells. Measurement at this stage showed that the capsule was midway in the second stage of growth.

Correlation of the stage of capsule enlargement and of the stage of seed development is interesting and may provide the amateur orchidist with a tool to determine the stage for successful, asymbiotic germination of *Cypripedium calceolus* v *pubescens*. That is,

- 1) days may be counted after pollination,
- 2) capsules may be measured and harvested midway during the second growth-in-diameter phase, and
- 3) seed may be examined microscopically for the  $\frac{1}{3}$  embryo development stage (Table 1).

To allow for natural variation, I would recommend harvesting several capsules at regular intervals, 40-55 days after pollination. After germination, seedlings should be kept in the dark at about 20°C, on the same slant, until they have developed an extensive root system (approximately 12 months). The seedlings may then be removed from the culture vessel, rinsed free of medium and planted. The potting medium should be organic, finely divided yet free-draining, and contain a few marble chips. The seedlings should never be allowed to dry out. It may take several years before the first expanded leaves appear. A cold annual rest period may be necessary for development.

Germination of Paphiopedilum species and hybrids has also presented problems to investigators. A few detailed studies exist (see Arditti, 1967; Arditti et al, 1982; Cribb, 1987 for reviews); many of the published reports present conflicting results. My investigations began as before with a question from an orchidist. "Can you germinate the seed of this primary Paphiopedilum cross?" For me, fundamental questions were "When can the capsule be harvested?" and "What are the optimum conditions for germination?"

Duncan and Curtis (1942) studied the fruit development of *Paph. faireanum*,

*bellatulum*, *villosum*, and *Paph. Maudiae*. They found, as with *Cyp. calceolus*, that the ovary growth in diameter took place in two stages separated by a slow growth period during fertilization. They reported that fertilization took place approximately six weeks after pollination in all test plants; the slow growth period continued for a further four to ten weeks, varying with the species, and within clones of the hybrid *Paph. Maudiae*. Thus, if one measures the capsule diameter at a marked point over time, one should be able to pinpoint

- 1) the commencement of fertilization, marked by a slowing of growth,
- 2) commencement of rapid seed development, marked by a second, rapid increase in capsule diameter, and
- 3) maturation of the seed, marked by a second and final slowing of capsule enlargement.

This is a simple way for anyone with a ruler or with an inexpensive pair of callipers to determine the desired stage to harvest seed.

The choice of germination medium can be a problem, given that species and hybrids may have varying nutritional requirements for seed germination and growth. Hegarty (1955) concluded that *Paph.* seed germinated best at 70°F (21°C) in subdued light. Ernst (1974; 1975) studied the use of activated charcoal in asymbiotic seedling culture of several genera including Paphiopedilums. Fridborg and Eriksson (1975) showed that activated charcoal probably absorbed some media compounds and thus was effective in modifying growth of tissue cultures. Some investigators have believed activated charcoal to be beneficial in that it darkens the medium, creating a more favourable medium for roots. Dallo Rosa and Laneri (1977) prepared several variants of Knudson's "C" medium including additions of banana pulp (8%), activated charcoal (0.2%), and coconut milk (10%), as well as varying the mineral content.

After reviewing these studies, I developed media recipes including 8% banana pulp and 0.2% activated charcoal, and decided to germinate the seeds at about 20°C in subdued light. I found that the addition of activated charcoal (Activated Coconut Charcoal, 50-200 mesh, 5-690A, Fisher Scientific Co. Ltd) to two different media definitely influenced germination of *Paphiopedilum* seeds, incubated in subdued light at 20 ± 2°C, and most definitely did not interfere with the passage of light (the charcoal particles sank to the bottom of the culture tube!). Various *Paph.* hybrid seeds, taken before capsule dehiscence, germinated well (v 75%) on media containing 0.2% activated charcoal and poorly on media without charcoal. Media used included Mother Flask Medium II (G. & B. Orchid Laboratories) and an homemade recipe (LRX) containing 8% banana pulp. Since this study, trials with Mother Flask Medium IV have shown it to be excellent medium for germinating of *Paphs.* No trials have been carried out with additions of activated charcoal to this medium.

Seedlings of *Paph. exul*, germinated asymbiotically in subdued light at 20°C on Mother Flask Medium II + 0.2% Activated Charcoal, were removed from flask after one year and were planted into pots containing a mixture of fine redwood bark and horticultural charcoal. After six months, a plant was removed and an apparently healthy root was sectioned and examined under the microscope. Mycorrhizal infection and peleton formation were observed. These observations, similar to those reported with *Cypripedium calceolus* seedlings show that asymbiotically raised seedlings may be successfully colonized with mycorrhizal symbionts. The seedlings continue to grow and prosper.

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## 13th World Orchid Conference 1990 Auckland, New Zealand, August 1989



### Highlights from Newsletter No. 14 REGISTRATION BOOKLET

Brochure and Forms are now available and have been distributed to all on our computer listing. If you require a Brochure, just return your reply form or simply write to 13th WOC, P.O. Box 29 152, Auckland 3, and we will send you a copy.

Favourable comments are being received on the booklet which has an eye catching cover created by New Zealand orchid growing identity Des Leahy.

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Good response is being received from overseas growers and we are expecting high registration numbers. We should match these with New Zealand registrants even though we have a small population. To do this 30% of your Society should be registering. One in three of your members. Is this happening? We are host to the orchid world in 1990, but we must be there to do it.

A World Orchid Conference is a once in three years show case for orchid growing. The 13th WOC is not in another remote country, nor even on our doorstep. It is right here in our home. If you do not attend you will regret it for ever. Register for the full events and be part of a friendly band of New Zealand growers to welcome and entertain kindred spirits from other countries.

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This only applies to plants purchased in November 1989.

**ALL MAIL ORDERS** postmarked within this period  
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Seedling and Mericlone Flasks—Wide selection including Mini and Standards to suit the hobbyist and commercial grower.

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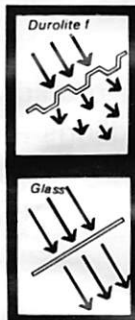
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These should produce good reds on small plants.

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Interesting cross with lots of reds or good shape.

**Slc. (Sassy Sofia x S. Cernua) 'Mighty Mite' x Slc. Yellow Doll 'Mini-Sun'**  
Bright orange & yellow cluster type flowers on very small plants.  
Flowers on young plants.

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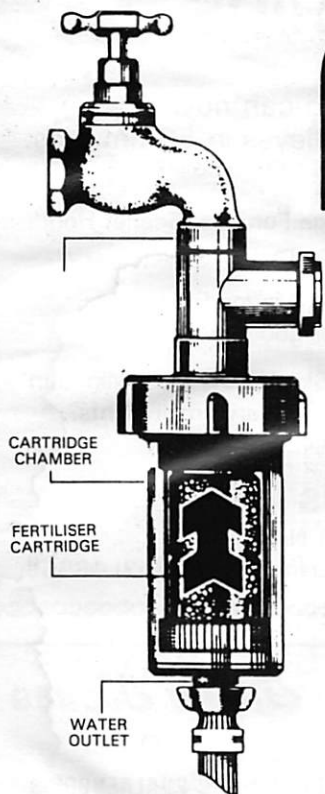
1. There may have been an increase in GST., but my prices remain the same — priced from \$7.00.
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## FERTILISER DISPENSER

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**The advantages of using Fert-O-Mat.** Easy to fit, simple to use, fertilise as you water, even distribution of fertiliser, use with any watering system, quick, convenient with excellent results. Unit comes complete with fertiliser plugs in initial purchase price.

**Orchid experts agree orchids do best with regular soluble fertiliser feeds of fairly low strength.**

Two analysis of fertiliser available—  
"Quick Green" corresponds to the U.S. recommendation for orchids of 30-10-10 or N.Z. 30-5-8.

"General Purpose" corresponds closely to the U.S. 10-10-10 for orchids in spike (generally known as the blossom booster).

Fert-O-Mat provides the three main elements N.P.K. in the proportions recommended by both U.S. and N.Z. Orchid experts for orchids (American Orchid Society Bulletin, N.Z. Orchid Review, Department Scientific & Industrial Research, Ministry of Agriculture & Fisheries). Both formula of fertiliser contain essential trace elements.

For best results use Fert-O-Mat with every watering. Quick Green is recommended for spring/summer growth, General Purpose blossom time.

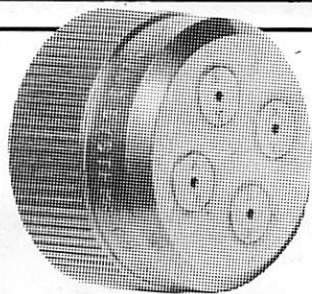
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# PORTRAITS OF NEW ZEALAND ORCHID SPECIES

Corybas taxonomy is still very fluid amongst some species, and professionals and keen amateur botanists are working together to try to clarify the position of variable species and a number of unnamed forms.



*Corybas macranthus*



*Corybas macranthus* has deep red, scented flowers which always come off the stem below the leaf. A lot of confusion has arisen with plants which have similar flowers but they do not arise from below the leaf.

It often forms dense carpets on shady forest floors.

*Corybas acuminatus* has a characteristic undulating, sharply pointed leaf, and a small flower just above the leaf. It is a species of shaded forest floor areas. ▼



*Corybas acuminatus*  
(formerly *C. rivularis*)