



**AUSTRALASIAN NATIVE ORCHID  
SOCIETY (VICTORIAN GROUP) INC.**

Reg. No. A0007188C ABN No. 678 744 287 84.

# BULLETIN

MAY 2016

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Visit our web site at: <http://www.anosvic.org.au>

## NEXT MEETING

**FRIDAY 6TH MAY AT 8.00 PM**

**TOORAK UNITING CHURCH HALL**

**603 TOORAK ROAD, TOORAK**

Melway Map 2M, K.7 or Map 58, K.4.

**COMBINED MEETING - ANOS VIC & ORCHID SPECIES SOCIETY OF VICTORIA**

## ITEM OF THE EVENING

**TWO TALKS BY DAVID BANKS**

***SARCOCHILUS SPECIES* - THE LITHOPHYTES**

***SARCOCHILUS SPECIES* - THE EPIPHYTES**

**(No hybrids apart from natural ones).**

We are delighted to have secured the services of David Banks, Editor of the Australian Orchid Review.

David will give one presentation before the break and the other presentation afterwards.

We look forward to greeting members of the Orchid Species Society of Victoria on this special occasion. Please make our visitors feel most welcome.

### **ON THE BENCH - EPIPHYTES & TERRESTRIALS**

As this will be a combined meeting, would ANOS Vic members please bench their display plants on the wall side of the hall and reserve the window side benches for OSSV plants.

**The Australasian Native Orchid Society promotes the conservation of native orchids through cultivation and through preservation of their natural habitat. All native orchids are protected plants in the wild; their collection is illegal. Always seek permission before entering private property.**



*Diuris pedunculata.*

Alan Firth took the photograph at the 2015 Spring Show.



**WHAT'S ON THIS MONTH****REGISTRATION REQUIREMENTS - CONSERVATION AND TERRESTRIAL STUDY GROUP ACTIVITIES**

Register by e-mail or telephone. Details required: - registrant's name, names of others attending, contact telephone number(s), mobile number(s) for activity day, emergency contact telephone number(s) in case of injury, etc., e-mail address. Register at least five days prior to the activity. Note that leaders often leave early to check locations and may not be contactable. It is the member's responsibility to cancel their registration or contact the activity co-ordinator if they are running late for start time. If you haven't registered, you won't be contacted if changes or cancellations occur. Non-registrants risk inconvenience.

**NEW MEMBERS ARE WELCOME AT ALL SPECIAL INTEREST GROUP ACTIVITIES**

**CONSERVATION GROUP**  
**CALADENIA ROBINSONII WEEDING AT ROSEBUD**  
**MORNING OF WEDNESDAY 4TH MAY**

Please meet outside Betty Cliff Reserve ready to commence at 10.00am.

The address is Betty Cliff Reserve, Widdop Avenue entrance, Melway Map 170, E.5/6.

As we will mainly be weeding small grasses, a tool, such as a screwdriver, or clean small trowel or fork will be useful, as will gloves and knee pads.

Please bring your safety vest / reflective jacket if you have one.

We plan to finish at 12.00 noon, giving you the afternoon to relax on the Peninsular.

Please register with Richard Thomson at:

[richardthomson2@bigpond.com](mailto:richardthomson2@bigpond.com)

or (03) 9850-9867. Mob: 0427-046-414 on the day.

When registering, please include your emergency contact details and your mobile phone number - both if you have a mobile.

**SEED GROUP**  
**SATURDAY 7TH MAY FROM 1.00PM**  
 at the home of  
**MARION & RICHARD THOMSON**  
**2 McGAHY STREET, LOWER TEMPLESTOWE**  
 Melway Map 33, B.9

Activities will include terrestrial seed sowing and replating.

Richard Thomson 9850-9867

[richardthomson2@bigpond.com](mailto:richardthomson2@bigpond.com)

**DIURIS FRAGRANTISSIMA**  
**SUNSHINE WORKING BEES**

Upcoming dates are May 9th and 23rd.

The area is still looking a picture and the orchids are coming up in good numbers.

**As the activity is on Railway land**  
**some special requirements apply.**

If you are interested in joining in, for more details and dates, please contact Len Carrigan at [tsg@anosvic.org.au](mailto:tsg@anosvic.org.au)



Activities this month



Advance notices

**EPIPHYTE STUDY GROUP**  
**SATURDAY 7TH MAY**  
**(PLEASE NOTE THIS IS NOT OUR USUAL DAY)**

**12.00PM BARBEQUE / 2.00PM MEETING**

at the home of

**STEPHEN STEBBING**  
**ORCHIDS ON NEWBOLD NURSERY**  
**303 MORRISSEY ROAD, STANHOPE**  
**(NEAR SHEPPARTON)**

Topic for Discussion: *Plectorrhiza tridentata*  
Our usual meeting day would fall on Mothers Day,  
so we will be visiting Steve on the Saturday.  
Because of distance, you may wish to car pool.

Please bring everything you need for the barbeque lunch, a folding chair if you have one, and please bring a plate of goodies to share at afternoon tea time.

Steve advises members to wear wet weather footwear.

Bring any other native orchid you would like to discuss during Skite Time.

Jeanne Dunn Mob: 0427-369-497

[esg@anosvic.org.au](mailto:esg@anosvic.org.au)

P.S. Should anyone need additional directions or a map, please contact Stephen Stebbing  
 Mob: 0412-352-604 [stephenstebbing@aapt.net.au](mailto:stephenstebbing@aapt.net.au)

**TERRESTRIAL STUDY GROUP**  
**ANGLESEA AUTUMN ORCHIDS**  
**SUNDAY 15TH MAY**  
 Melway Map 196, F.6

Meet at the Anglesea Bowling Club car park opposite the main shopping centre ready for a 10.00am start.

We will be exploring a number of sites in and around Anglesea for autumn flowering orchids.

Margaret MacDonald (mobile 0412-652-419) will be our guide for the day.

Please be self-sufficient for the day and please wear your name badge if you have one.

All attendees need to register with Neil Anderton.

Ph: (03) 5281-5382. Mobile on the day: 0417-519-397

[Anderton@aanet.com.au](mailto:Anderton@aanet.com.au)

**DIURIS FRAGRANTISSIMA SITE MAINTENANCE**  
**TUESDAY 17TH MAY FROM 8.00AM**

Please meet at the Laverton site. Please feel free to arrive at a time that suits you. Please contact me if you need directions to the site.

The main activities for the morning will be monitoring for emerging orchids, quadrat monitoring and removing emergent weeds.

Should the weather be foul the morning will be cancelled. Registrants will be notified of cancellation by email on the afternoon of the 17th.

Richard Thomson 9850-9867 mobile on the day 0427-046-414

**AUSTRALIAN PLANTS SOCIETY**  
**YARRA YARRA GROUP**  
**AUTUMN NATIVE PLANT SALE**  
**SUNDAY 1ST MAY, 10.00AM - 3.00PM**  
**CNR. BROUGHAM STREET & MAIN ROAD**  
**ELTHAM**

Tubestock to advanced plants, indigenous and grafted stock too. Autumn is the best time for rejuvenating and planting your garden. Ph. 9439-7228 [apsyarrayarra@gmail.com](mailto:apsyarrayarra@gmail.com).

**8TH NATIVE ORCHID CONFERENCE & SHOW**  
 in association with the  
**KEMPSEY SPECIOSUM SPECTACULAR**  
**THURSDAY 1ST SEPTEMBER TO**  
**SUNDAY 4TH SEPTEMBER 2016**  
 Hosted by ANOS Mid North Coast Group Inc  
 and Ted and Winsome Walmsley  
**KEMPSEY DIRT BIKE TRACK,**  
**ALVERTON STREET, GREENHILL, VIA KEMPSEY**

Registration forms are available at  
 ANOS Vic monthly meetings.

Enquiries: ANOS Mid North Coast Group  
 69 The Lakes Way, Forster, NSW 2428  
 or e-mail to: [jzi01935@bigpond.net.au](mailto:jzi01935@bigpond.net.au)



Urgent/important notices



Non-ANOS Vic notices



**AUSTRALIAN PLANTS SOCIETY VICTORIA INC.**  
**FJC ROGERS SEMINAR**  
 Hosted by SGAP Hamilton  
 & APS Warrnambool & District Group  
**TERRESTRIAL & EPIPHYTIC ORCHIDS**  
**SATURDAY 8TH & SUNDAY 9TH OCTOBER 2016**  
**KANTOR MUSIC & PERFORMING ARTS CENTRE**  
**HAMILTON & ALEXANDRA COLLEGE**  
**1 CHAUCER STREET, HAMILTON, VICTORIA**

To register your interest, contact: [ksparrow93@gmail.com](mailto:ksparrow93@gmail.com)  
[fjcrogers2016@gmail.com](mailto:fjcrogers2016@gmail.com)  
[apswarrnambool.org.au](http://apswarrnambool.org.au)

**ANOS TRAVEL CLUB**

**2016 SOUTHERN WESTERN AUSTRALIA TOUR**  
**DEPARTS PERTH SUNDAY 11 SEPTEMBER 2016**  
**PRICED FROM \$2207 PER PERSON TWIN SHARE**  
**PLUS AIRFARE TO PERTH**

This tour is fully escorted from Perth by Andrew Brown, author of *Orchids of Western Australia* and *Field Guide to the Orchids of Western Australia*.

This package includes: ❖ Airport transfers in Perth. ❖ 1 night Mercure Perth with dinner and breakfast. ❖ Transport in air conditioned coach throughout. ❖ 1 night New Lodge Motel - Katanning - dinner, bed & breakfast. ❖ 1 night Jerramungup Motel Hotel - dinner, bed & breakfast. ❖ 1 night Mt. Barker Valley Views Motel, Mt. Barker - continental breakfast. Dinner at local restaurant/hotel, Mt. Barker. ❖ 2 nights Nelsons of Bridgetown Hotel - dinner, bed & breakfast. ❖ 2 nights The Grange on Farrelly Hotel, Margaret River - dinner, bed & breakfast. Lunch at Watershed Wines Winery, Margaret River with wine tasting. ❖ 2 nights Mercure Perth with dinner and breakfast. ❖ Day tour in Perth, including orchids and Kings Park. ❖ Free afternoon in Perth before farewell dinner at your hotel. ❖ A packed lunch will be provided each day during touring.

Enquiries: ANOS web site or John Zeitz.  
[jzi01935@bigpond.net.au](mailto:jzi01935@bigpond.net.au)

**MEETING DATES 2016**

June 3rd, July 1st,  
 August 5th, September 2nd, October 7th,  
 November 4th & December 2nd.

Speakers and their topics will be listed when confirmed.  
 ANOS Vic Spring Show - 24th & 25th September.

*Aging: Eventually you will reach a point when you stop lying about your age and start bragging about it.*

**COMMUNICATIONS COLUMN**

**NEW MEMBERS** The Society has much pleasure in welcoming:

Robert & Rosalie Lawrence - Camden Park S.A.  
 Noni & Gary Johnson - Aireys Inlet Vic.

**BEST WISHES, IAN** Ian Maher is now recovering from major surgery. All Ian's friends at ANOS Vic are thinking of him and wishing him a speedy recovery.

**CULTURAL CERTIFICATES - 1ST APRIL 2016**

TCC446 - Helen Richards - *Diplodium coccinum* Bowral, NSW.  
 (This plant was also the recipient of TLT 23 in 2014.)

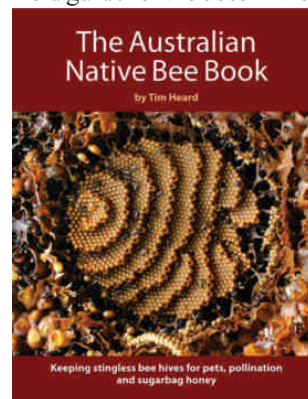
**FURTHER TO THE PRESENTATION BY DR. REMKO LEIJS** at the March 2016 meeting. I have received a few enquiries from members wishing to purchase a book on Australian native bees.

Unfortunately Dr. Leijs does not have a general publication on native bees, only scientific papers with revisions of groups and species descriptions. The best info that he can suggest is the following website:

<http://mrccc.org.au/wp-content/uploads/2014/02/Attract%20Bees%20v2.pdf>

And a recent book about stingless bees by Tim Heard ([www.nativebeebook.com.au](http://www.nativebeebook.com.au))

Tim Heard also gives a general introduction about native bees and there is also the AUSSIE BEE website which may have a concise field guide for the bees in the Sydney region for sale: ([www.aussiebee.com.au](http://www.aussiebee.com.au))



Would you believe it - less than an hour after I had typed the above into this *Bulletin*, I received an E-catalogue from Andrew Isles Natural History Books in Prahran. (Google for further info.)

[Stock ID:38437] The Australian native bee book: keeping stingless bee hives for pets, pollination and sugarbag honey by Tim Heard. West End: Sugarbag Bees, 2016. Octavo, paperback, 246 pp., colour photographs, text illustrations, maps. AU\$35.00

This complete guide to native stingless bees is written by Australia's foremost expert. Keeping native stingless bees is a hot topic in Australia for commercial, environmental and recreational reasons. This comprehensive guide covers bee biology, behaviour, nesting, social life and foraging; how to build a native bee hive; how to transfer a bee colony to a hive box and propagate hives; all about sugarbag honey, including how to extract it from hives, hive management; identifying and dealing with pests; using stingless bees for pollination. It also includes a complete list of Australia's stingless bee species; how to identify them, their characteristics, where they occur, and recommended hives.

**QUESTION & ANSWER TIME**

At every meeting, we will be having a Q and A time session following each bench commentary.

Any member with a question regarding the cultivation of native epiphytic or terrestrial orchids is asked to e-mail Richard Austin at [richardaustin610@gmail.com](mailto:richardaustin610@gmail.com)

or drop a line to: Richard Austin, 82 Price Avenue, Mt. Waverley 3149. Your questions will then be put to our experts on the night, with the answers published in the following *Bulletin*.

*When you are dissatisfied and would like to go back to youth, think of Algebra.*

*One of the many things no one tells you about aging is that it is such a nice change from being young.*

**ANOS VIC SPRING SHOW**  
**24TH & 25TH SEPTEMBER 2016**

The ANOS Vic Spring Show - our annual show - is coming up fast and I would like anyone who is interested in helping out with the organisation of different areas to please meet me at the hall on meeting night between 7.15pm and 7.45pm. We can discuss a theme and who would like to organise what. If anyone is unable to attend but would like to have an input or offer an opinion, please call me and discuss. Evenings are the best time to call. Home telephone number is (03) 5145-5670. Mobile coverage is difficult and Telstra does not cover our area adequately. Love to see as many as possible there. Jeanne Dunn, Spring Show Convenor.

## LAST MEETING - 1ST APRIL 2016

From information supplied by Dr. Peter Bernhardt.

### BLUE LADIES & SHOWY SLIPPERS: DARWIN'S ORCHIDS REINTERPRETED BY

RETHA EDENS-MEIER AND PETER BERNHARDT

ST. LOUIS UNIVERSITY, USA  
Presented by Dr. Peter Bernhardt.

A Synthesis of Chapters 1, 7, & 10.

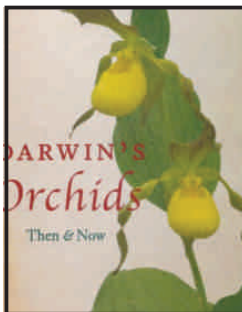
Based on two symposia presented at International Botanic Congress, Melbourne, Australia, 2010. Twelve chapters, 22 international co-authors. The Small Book With The Long Title (Darwin, 1862) - *On the Various Contrivances by Which British and Foreign Orchids Are Fertilized by Insects, and on the Good Effects of Intercrossing.*

Darwin's orchid book was first published after his *On The Origin of Species*, but correspondence shows that the orchid book is based on at least 20 years of research. Darwin's research into orchids began after his marriage and consequent move from London to rural Kent.

But Why an Orchid Book? There was no mention of orchids in Darwin's Voyage of the Beagle, but he did collect some South American orchids. Back in England, Darwin's letters discuss the structure and function of bilaterally symmetrical flowers.

Why Orchid Flowers? Darwin had access to six native orchid species within a short walk of Down House, his home in Kent. Studying orchid flowers was also affordable. Darwin built a greenhouse and received tropical exotics from Kew (Hooker) and John Bateman.

Studying botany, with an emphasis on flowers, was a fashionable hobby of the educated during the 19th century,



*Chloraea magellanica* from Chile. Darwin collected it in the Falklands during his voyage on the Beagle.



*Orchis coriophora*,  
Photo: John Palmer.

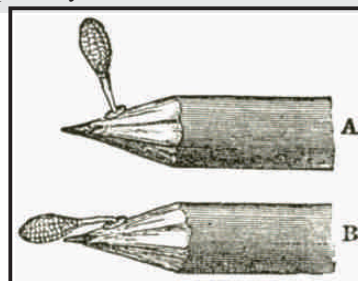
and there were fads for different wild species of orchid from the 1830s to the 1890s.

Darwin's response to those who attacked *On The Origin of Species* was: "Of all the carpenters for knocking the right nail on the head, you are the very best: no one else has perceived that my chief interest in my orchid book has been that it was a "flank movement on the enemy". (Letter to Asa Gray, July 1862.) Contents of the first edition (emphases): Floral biomechanics of 28 species (15 genera native to Britain and 42 species of tropical species - a total of 43 genera) Floral structures and organs, described and illustrated by previous botanists over 70 years, were interpreted as adaptations (famous pencil experiment). Adaptations are the result of descent through modifications. Floral homology is this book's punch line; interpreted as adaptations (famous pencil experiment).

**But, Did Darwin Interpret All Flowers Correctly? No!** Gray's letter (1863) disagrees with Darwin's original description of pollen removal and reception in *Cypripedium (Paphiopedilum)*. Darwin re-tested his first interpretation using an American *C. parviflorum* and an English *Andrena*

species and discovered Gray was correct. Darwin refers to his original interpretation as "his blunder in print."

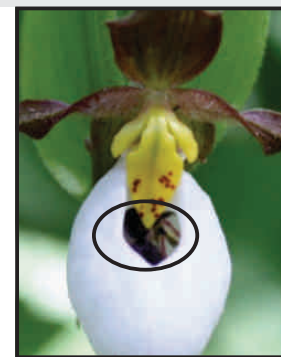
Darwin's *Andrena* experiment results were published fully in 1877. All cross-pollinated species in sub-family Cypridiodeae have the same architecture, although attractants (color and odor) vary widely in five genera.



The famous pencil experiment:  
When first collected,  
the pollinia stands upright,  
but it flops as it ages.



*Cypripedium parviflorum*.  
Photo by Retha Edens-Meier.



In one way and out the other - a bee exiting *C. montanum*.  
(Pollinator circled.) Photos by Dr. Nan Vance.

Paired exit hole sizes are critical for pollen dispersal as is the size of the pollen vector.

In all the Chinese and North American *Cypripedium* species studied to date, the orchid does not offer a reward. Pollen load analyses show duped pollinators are highly dependent on co-blooming flora offering nectar and/or pollen.

Pollen load analysis: Over a period of three seasons (two sites), it was found that 41-58% of bees leaving *C. montanum* carried the orchid's pollen BUT 75-100% of those same bees carried pollen of a co-blooming nectar/pollen producing wildflower or shrub, even if they were not carrying the orchid's pollen.

Pollinator limited? Research shows insects wise up fast and that food mimics have low visitation rates (Tremblay et al. 2005). But our results show variation between species in conversion of flowers into fruits (*C. reginae* vs. *C. montanum*). Pollinators vary according to flower size and attractants. Species conversion of flowers into fruit: *C. acaule* - 1-25%, *C. flavum* - 7-9%, *C. reginae* - 4-33%, *C. japonicum* - 5-7%, *C. montanum* - 75-85% and *C. plectrochilus* - 38-45%.



Pinned bee is a female, *Lasioglossum olympiae* carrying a pollen smear of *C. montanum*.  
Photo by Dr. Andrew Huber.



**Sun Orchids and The Second Edition (Darwin, 1877)**

The differences between the 1862 and 1877 editions. The second edition was no longer only a book of biomechanics and homology. This edition (1877) expanded early concepts on the evolution of reproductive ecology. Information on 37 species from North America, Eurasia, South Africa, and Australasia was added. Biodiversity was emphasised in the second edition.



*Thelymitra crinita*  
Photograph by  
Dr. Retha Edens-Meier.

Robert Fitzgerald (1830-1892), from Australia, sent Darwin his earliest chapters from *Australian Orchids*. Darwin used Fitzgerald's interpretations, but was especially interested in *Thelymitra*.

Fitzgerald paired large flowered and small flowered species. He found that the three small flowered species self pollinated. However, Darwin focused on the self-pollinating species because he believed self-pollination led to a decline in reproductive fitness.

During this period of "tunnel vision", Darwin ignored the large flowered sun orchids. Fitzgerald's treatment of large flowered, probably cross-pollinated species, was ignored in favor of Darwin's emphases on the self-pollinated species. Few authorities examined the pollination ecology of large flowered species until the 1970s to the present time.

Over 100 species of *Thelymitra* from Australasia have been described, but Western Australia is the centre of diversity. It is estimated that 50% of the species are either facultative self-pollinators or are subcleistogamous. However, seven large flowered species have been studied and all are insect pollinated.

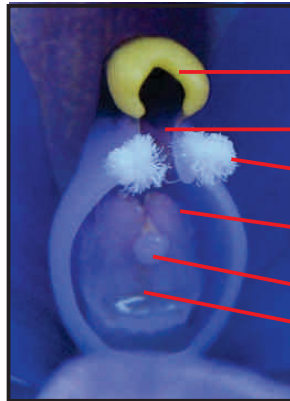
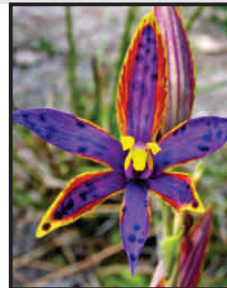
Findings: Insect pollination of large flowered species since the 1970s. No rewards were detected and the major pollinators are endemic female bees in four genera. Some pollination is possible by syrphid flies and euryd wasps. Conversion of flowers into fruit is very low.

Hood Evolution (based on the old Darwin homology). Without a reward, why do insects visit this flower? The answer is, the flower is strongly scented and insects are attracted to colors and sculptures on the column ("hood" = mitra). The lip petal is usually identical in shape and color to lateral petals and the three sepals.



Left: *Thelymitra magnifica*. Right: *Thelymitra variegata*.

Hood variations of large flowered species. Photos: Dr. Retha Edens-Meier



Left: Hood structure, *Thelymitra macrophylla*. Hood: extends to base.

Anther.  
Column arm.  
Stigma lobe.  
Rostellum/Viscidium.  
Stigma.

Photograph: Retha Edens-Meier.

Deposition of the pollinarium on a foraging bee is identical in all seven large flowered species studied to date. As the bee forages on the hood, the abdomen contacts the rostellum and the pollinarium is withdrawn as the bee exits. These bees are also generalist foragers carrying one to five co-blooming pollen/nectar species as well as the orchid's pollinia. However, in the three species studied, relatively few bees fell for the orchid's trick more than once.

Regardless of species, *Thelymitra* petals open between 9:00am and 10:00am and shut between 3:00pm to 4:00pm. When mature, all flowers on the same inflorescence open synchronously.



Left: *T. antennifera*. Right: *T. macrophylla*. Photographs by Dr. Andrew Brown.



Hybrid characters are most likely to intergrade, but some are more likely to align with one parent. Malformation of the hood prevents pollinia dispersal in 42% of the Tenterden hybrids. (The pollinia fall out of the anther onto the ground without ever connecting to the rostrum). The flower can still receive pollen, though.



Right: A Tenterden hybrid.



Is this flower on the right evidence that first generation hybrids backcross to their yellow parent? Maybe.



A new hybrid *Thelymitra macrophylla* crossed with *T. crinita*. (The 4 photos in this column are by Dr. Retha Edens-Meier.)

Conclusions and possible future research. Similarities between *Cypripedium* and *Thelymitra* lineages.

1. Vernal to summer flowering.
2. Typical long floral life span of a mimic orchid (1 to 2 weeks).
3. Both are food mimics exploiting optimal foraging.

4. Both depend largely on generalist foraging bees.  
 5. Stamines hypermorphic but adaptive and incorporated into attraction and false reward system. 6. Several species in both lineages are pollinator limited. 7. Interspecific hybridisation common (especially in Chinese *Cypripedium*). 8. All species studied to date are self-compatible if self-pollinated by hand (epifluorescence experiments).

**Dis-similarities:** Color differences: no blue *Cypripedium*.

Labellum does not play a role in pollinator attraction nor pollinia removal or deposition in *Thelymitra* (unlike *Cypripedium* and 99% of orchid family). *Cypripedium* typically produce the largest flowers in their habitat while *Thelymitra* produce flowers of equal size but far more per stalk. *Cypripedium* does not put on a disappearing act. Fruit set more variable between species of *Cypripedium* (as high as 85%).

**Future suggested research:** Expanding research into China where the vast majority of *Cypripedium* species and other temperate zone genera treated by Darwin are found.

**Future *Thelymitra* research:**

Genetic analyses of *Thelymitra* vs. hybrids to determine the role of speciation by amphidiploidy previously confirmed for four species found only in New Zealand.

**Acknowledgements - across two hemispheres.**

National Geographic Society, Grant #8530-08.

Kingsley Dixon and staff, from the Kings Park and Botanical Garden, Perth, WA.

Andrew Brown, Perth, WA.

Professor Luo Yi-bo, Chinese Academy of Science, Plant Systematics and Biology Laboratory, CAS, Beijing, China.

Robert Raguso, Cornell University, New York, NSF Grant DEB-

0746106.

Mike Arduser for Missouri bee identifications.

Michael Batley, Sydney, Australia, for bee identifications.

Terry Houston, Perth, WA for bee identifications.

George Y.

Bruce Schuette, Cuivre River State Park.

Craig Fowler, Creve Coeur Camera, St. Louis, Mo.

Jake Edens, St. Louis, MO.

Nan Vance, Kooskia, Idaho.

Editor: If you are interested in purchasing a copy of *Darwin's Orchids Then and Now*, more details and ordering information are available at the following website:

<http://www.press.uchicago.edu/ucp/books/book/chicago/D/bo18659332.html>

## ON THE BENCH EPIPHYTES - 1ST APRIL 2016

Commentator: Barbara Duncan Recorder: Helene Wild Photographer: Ivan Margitta

**SPECIES:** *Dendrobium bigibbum*, *schneiderae* 'major', *schneiderae* 'minor', *trichostoma* (PNG), *Dockrillia cucumerina*, *Liparis nugentae*, *swenssonii*, *Sarcochilus hirticalcar*.

**HYBRIDS:** *Dendrobium* Grace Robson, *Den/Dock calamiforme* x *cucumerina*, *hepatica* x *Tweetie*, Hot Coals, *nugentii* x *X grimesii*, *sulphurea* x *hepatica*,

*Plectochilus* Cherub, *Sarcochilus falcatus* x *hirticalcar*.



There were two *Liparis* species benched at this meeting - *L. nugentae* and *L. swenssonii*.

Over the years, much has been said about the "perfume" of *Liparis* species. As our meeting night was quite warm, the flowers were releasing their powerful pong with gay abandon - as testified by those seated close to the epiphyte display benches.

Now let's concentrate on the more positive aspects of *Liparis* species. As a general rule, they are easy to grow and, given reasonable care, some of the larger species will quite quickly develop into sizeable specimens. Individual flowers are usually dull coloured (green, yellowish, etc.) and fairly insignificant, but there are a lot of flowers on each inflorescence. Back to the pong - it is not overpowering in an airy shadehouse, but will become obnoxiously obvious in a warm enclosed space such as the back of your car on the way to a meeting! Doug, who inhaled appreciatively? informed us that *L. nugentae* has a stronger perfume than *L. swenssonii*.

Plants are adaptable and can be grown in pots or on mounts. Gabor and Julianna Szep's *L. nugentae* was growing on a mount while Alex Wild had his *L. swenssonii* in a pot.

Photo: Alex Wild's *L. swenssonii*.



Barbara Duncan's *Dendrobium cucumerinum* / *Dockrillia cucumerina*. Three Cucumber Orchids (the common name refers to the fleshy, cucumber-shaped leaves) were benched by three growers - Barbara Duncan, Marion Thomson and Alex Wild.

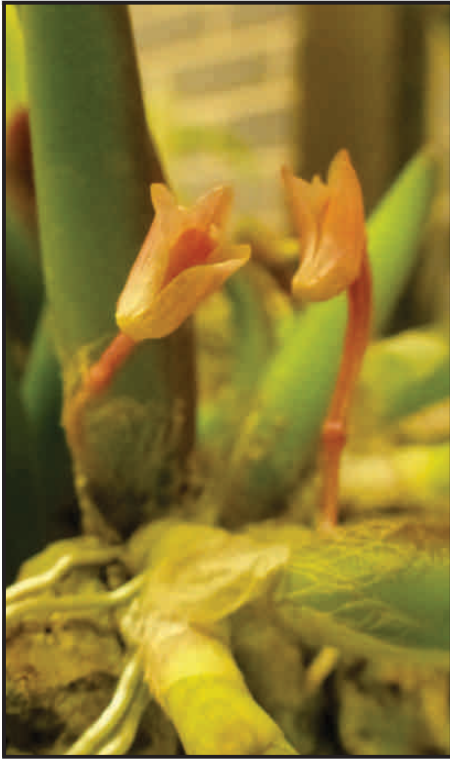
Barbara confessed to bringing her plant along because she thought it was flowering very late in the season and there wouldn't be any others for members to see.

This species can produce flowers sporadically between November and

February, so the beginning of April is late. (I suspect this will be its last fling before winter arrives.)

All three plants were growing very well mounted on black treefern and, as Barbara pointed out, they do tend to wander around and around the mount, thus ending up with no particular "front face"! Alex also has a few small, but contented, plants in terracotta pots and scoria. Although the species comes from "up north", it grows well in Melbourne - given the usual light, air movement and watered according to the season and the conditions in your shadehouse or growing area.





*Dendrobium prenticei*  
grown by Chris Krolkowski.  
A tiny, but lovely, species endemic to north eastern Queensland where it commonly grows at high elevations on the outer branches of rainforest trees. Occasionally plants are found in lowland situations. In Melbourne, this species is commonly grown on mounts of cork, hardwood or treefern and placed in a shadehouse where they will enjoy cool, humid conditions.



*Dockrillia calamiformis* benched by Jeanne Dunn.  
*Dockrillia calamiformis*, the Northern Pencil Orchid, is endemic to north eastern Queensland where it is commonest at higher altitudes on the ranges and tablelands. Jeanne is absolutely passionate about her terete-leaved species and hybrids, and she grows them exceptionally well in her shadehouse in Gippsland. Plants require good light, free air movement and humidity. In cultivation, they are usually mounted onto a slab of hardwood and hung high in the orchid house.

Left: *Den/Dock nugentii* x *X grimesii* owned by Jeanne Dunn.  
Another of Jeanne's delightful terete-leaved plants, this time a hybrid between the button leaved *Dockrillia nugentii* and *D. X grimesii* which is a natural hybrid between *D. calamiformis* (terete leaves) and *D. nugentii* (tongue or button shaped leaves). Again, this hybrid is easy in cultivation when given the usual, light and air movement. But I cannot emphasise too strongly that when and how much water to apply will depend on the season and the conditions in your growing area.



*Dendrobium bigibbum* benched by Gabor and Julianna Szep.

I will risk offending a certain politician by granting myself a "Captain's Pick" and writing a little more about *Dendrobium bigibbum*.

Barbara didn't comment on the big purple blooms, but with a small space to fill, and having received Ivan's beautiful photograph, I will mention Gabor and Julianna Szep's magnificent specimen plant before the species goes into recess until late summer and early autumn next year.

As it is widely recognised as Queensland's floral emblem, *Dendrobium bigibbum* is probably Australia's best known native orchid. With its big, bright purple blooms, it is very popular in cultivation, although many growers living in our southern states struggle to keep it alive over our coldest months.

*D. bigibbum* is typically tropical in its requirements (hot wet summers followed by warm dry winters), so its cultivation in southern Australia's Mediterranean type climate (hot dry summers and cold wet winters) is difficult to say the least.

It is acceptable practice to water profusely over the summer months, then some growers keep their plants bone dry over winter. During winter, Daryl Williams, also an excellent grower of *D. bigibbum* and its hybrids, dunks his pots (to brim height) into warm dishwashing water once a week after he has finished that evening chore. Daryl is careful not to wet the pseudobulbs or the foliage at this time of year.

Other members bring their plants inside the house over the winter period. Provided the window faces the "right" way, the bathroom window ledge is a favourite spot.

There is limited time at meetings for plant commentaries and photography and the *Bulletin* is restricted to 14 pages. So please do not be disappointed if your orchid is not featured in the On The Bench reports. Its omission has nothing to do with the quality or desirability of your plant.



## ON THE BENCH TERRESTRIALS - 1ST APRIL 2016

Commentator: Mike Wicks Recorder: Helen Richards Photographer: Ivan Margitta

*Eriochilus cucullatus*, *dilatatus*, *Diplodinium abruptum*, *coccinum* (red), *longipetalum*, *pulchellum*, sp. aff. *revolutum*, *Pterostylis coccina*, *laxa*, *truncata*, *Spiranthes odorata* (a ring-in from the USA & Canada).

Mike first commented that it is an exciting time of the year for terrestrial growers, with new plants coming up daily. It is also the time of the year when an important decision must be made - when to remove the extra shading from the shadehouse as light levels decrease.



Helen Richards benched this pot of *Diplodinium coccinum*. Autumn-flowering *Pterostylis* (*Diplodinium*) were well represented, with the red flowering form of *Diplodinium coccinum* being a favourite. *D. pulchellum* also has deep red infusions. Are the red 'greenhoods' popular because they are uncommon and not 'green'?? Mike pointed out that the autumn flowering greenhoods (*Diplodinium*) have two plant growth forms. Flowering plants have cauline leaves, i.e. the leaves occur up the flowering stem, whereas non-flowering plants have a flat

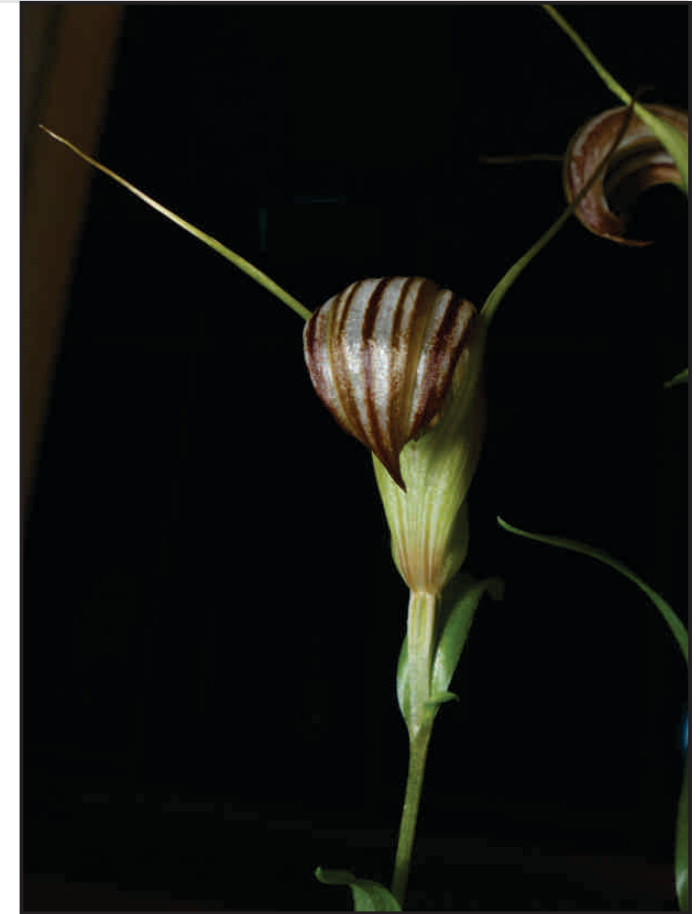
rosette. All growers wait anxiously at this time of the year for the pointed flowering shoots to appear through the mulch rather than the circular non-flowering shoots.

Two pots of red *D. coccinum* were benched, both from the same Bowral locality, i.e. I had given Russell Mawson the tubers originating from my plants. They reflected how plants respond to different growing conditions and areas.

Mike commented on the differing shapes of the galea of the greenhoods being well illustrated, with *D. abruptum* having a galea where the dorsal sepal is bent right over, *D. sp. aff. revolutum* having a deeply curved galea, and *D. coccinum* only a partly curved galea. There are species of greenhoods in flower every month of the year.



*Eriochilus cucullatus* was benched by Owen Andrews. Two *Eriochilus* species were on display. *E. cucullatus* from the eastern states and *E. dilatatus* from Western Australia. The flower stem of *E. cucullatus* can reach 25cm in height, while that of *E. dilatatus* can attain a height of 40cm. Cultivation techniques are similar to those of *Caladenia*. There was a big difference in flower size between the two pots of *E. cucullatus* benched, Owen Andrews' flowers being much more open and robust than mine.



*Pterostylis truncata* grown by Russell Mawson. *Pterostylis truncata* / *Diplodinium truncatum* is a very frustrating species with regards to flowering. Richard Austin said that the tubers he put into pots this year and have been watered since New Year's Day and are only just coming through. However the plants that he had put into his garden the previous year are well ahead of the potted ones, with many flowering. The garden has been lightly watered over summer and the plants are spreading through his sandy soil. Blackbirds, of course, love orchid plants so Richard has used wire hanging baskets placed upside down over the plants to protect them from the digging birds while they are coming through.

Mike called for progress with the *Pterostylis curta* tubers handed out two months ago. Members reported on using quite different mixes, so it will be very interesting to hear of their further progress.

Richard Austin emphasised the importance of watching out for pests.

❖ Mealy bugs can lurk around the base of the plant - spray with pyrethrum.

❖ Thrips are tiny insects that get into crevices of plants and cause plant growth to be distorted. They can distort emerging shoots. Spray with pyrethrum also.

❖ Eggs from these pests remain in the potting mix, so re-pot at the end of the season, using fresh mix only for any affected pots.



*Diplodium* sp. aff. *revolutum*  
benched by Helen Richards.

Greenhouse season is upon us and there will be many more species flowering over the next few, cooler, months. Members of the *Pterostylis* complex are distributed mainly in Australia and New Zealand with representatives in New Guinea and some South Pacific islands.

Within Australia, this genus is most prolific in the southern states, but a number of species occur in subtropical eastern Australia and on the ranges and tablelands of tropical Queensland.



*Diplodium* sp. aff. *longipetalum*  
(Mt Raymond, Vic)  
benched by Helen Richards.

## A DAY AT KINGLAKE

Helene Wild with photographs by Alex Wild

The Epiphyte Study Group's visit to Eddie and Robyn Sabljak's Fern Acres Nursery on Sunday 3rd April was very well attended. While a few of the group's stalwarts were, unfortunately, unable to be there, a few "newbies" enjoyed the day's activities.

Eddie always has plenty for us to see, and everyone was keen to learn about his new floor-heated igloo. All the igloos at Fern Acres are covered with 75% shadecloth, and the vents at both ends are left open at this time of year. However, during the winter months, those vents will be closed, especially at night as temperatures at this altitude are colder than those in Melbourne. Heavy winter frosts are a common occurrence and, occasionally, snow will fall at Kinglake.

The older igloos were originally lined with Matrix Cloth, but Eddie explained that material is not UV resistant, and it gradually disintegrated over a period of approximately three years.

Because of Victoria's extended spell of dry weather, Eddie and Robyn recently installed guttering on the igloos to channel rainwater run-off into storage tanks. Every drop of water is precious when you are running a plant nursery!

Eddie, whose ambition it is to re-establish a *Sarcochilus australis* colony at Kinglake (to replace the colony that was destroyed during the Black Saturday fires), has sent seed to several flasking laboratories. However, the Kinglake seed is proving obstinate and, so far, flasking attempts have been unsuccessful. It is interesting to note that seed from New South Wales plants germinates satisfactorily in flasks - so why won't the Kinglake seed "take"?

The topic of the day was *Sarcochilus hirticalcar* and *S. hillii*. It appears most members are not having much success with either of these two species. In fact, it would be fair to say that many growers find them frustrating. Having said that, Eddie grows both species to perfection. We all assumed he must have the perfect (humid) conditions in his igloos.

*Sarcochilus hirticalcar* (syn. *Parasarcochilus hirticalcar*) is a small epiphyte that forms semi-pendulous clumps. It is endemic to the McIlwraith Range of north-eastern Queensland where it can be found in rainforests and also in open vegetation on the floodplains of small streams. One of its preferred hosts is *Dillenia alata* (Red Beech). Plants are usually small, but occasionally one will come across a larger plant. Flowers are beautifully coloured and dramatically marked. This species requires warm, humid conditions (which is probably why they grow so well in Eddie's cosy-warm igloos) and abundant air

movement. A minimum temperature of 10°C is recommended. Baby's Tears on the floor gives a clue to the humidity maintained in the Fern Acres igloos.



Carpets of Baby's Tears on the floor of this igloo is a good indication of humidity in this growing area.



A flowering *Sarcochilus hirticalcar* at Fern Acres.





Nette Meggetto, Helene Wild & Barbara Duncan.

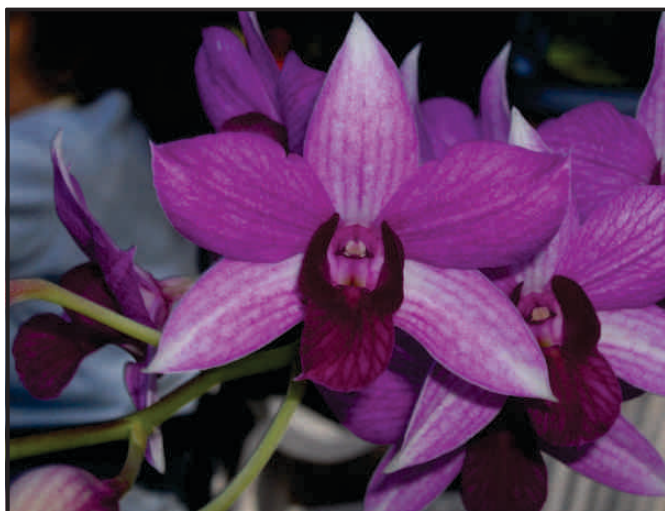


This type of narrow timber mount is very successful at Fern Acres. Eddie lists a lot of plants on Ebay, preferring to sell established mounted plants rather than bare rooted ones because, he says, established plants have a better chance of survival.

The second species on our discussion agenda was *Sarcochilus hillii*. This is a very small epiphyte (occasionally lithophyte) with a distribution from New South Wales to central eastern Queensland (Nowra to Rockhampton), and from coastal lowlands to around 700 metres altitude. Plants are often missed because they “get lost” against the bark of the host tree. As with several other *Sarcochilus* species, the roots are often the first part of the plant to be noticed. *S. hillii* grows in a variety of habitats, but most commonly in dry but humid gullies and in drier rainforests.



Our host, Eddie Sabljak, during our Skite Time discussions.



*Dendrobium bigibbum x engae* (PNG)  
one of Daryl Williams’ Skite Time plants.



*Bulbophyllum exiguum* grown by Eddie at Fern Acres and shown during Skite Time. The mount is a thin slice of granite.



One of the larger *Sarcochilus australis* plants Eddie has established on trees at Fern Acres Nursery.

*S. hillii* is notorious for steadily declining in cultivation. However, as plants can sometimes be successfully established on live hosts such as *Melaleuca styphelioides* and *Callistemon viminalis*, this method of cultivation is well worth attempting. As usual, ESG members had a great day at Fern Acres. Our thanks to Eddie and Robyn for hosting our meeting.



## ALL DRESSED UP AND STRUTTING OUR STUFF ... AT SHOW TIME!

Photographs taken by Ivan Margitta at the 2015 Spring Show

A reminder that ANOS Vic's annual Spring Show will be on the 24th & 25th September at the usual venue, the Mt. Waverley Community Centre, Miller Crescent, Mt. Waverley. Jeanne Dunn will, again, co-ordinate the show.



*Den/Dock Luscious Lip 'Pinky JD'*



*Dendrobium Stunning*



*Arachnorchis rileyi*



*Dendrobium kingianum 'Big Foot'*



*Den/Dock Green Jem x Rosemary Jupp 'Dasher'*



*Arachnorchis cardiochila*



# POLLINATION BIOLOGY OF *CORUNASTYLIS* SPECIES IN NEW SOUTH WALES

Dr. Peter Bernhardt

Recipients of a grant from the Australian Orchid Foundation to study the pollination biology of *Corunastylis* species in New South Wales have completed their initial collection of field data in NSW. Field studies began at the end of December and concluded a few days before the Easter weekend. Initial studies concentrated on *C. fimbriata*, *C. ruppilii* and *C. filiformis*, but Mr Brian Towle joined the consortium and will contribute data on *C. densa*, *C. pumila* and their pollinators from sites at Royal National Park. Plant voucher specimens in 70% ethanol have been deposited at the Royal Botanic Gardens and Domain Trust (Sydney).

Wendy Grimm (Australian Plants Society), Peter Bernhardt (St. Louis University, Missouri), Zong-Xin Ren (Kunming Institute of Botany, Yunnan, China) and Peter Weston (Royal Botanic Gardens and Domain Trust, Sydney) concentrated on field sites near Arcadia, Kulnura and Ku-Ring-Gai Chase National Park in New South Wales. Populations varied in size according to site and species, ranging from 40 - >150 flowering stems. As anticipated, the dominant pollinators of the three species studied by Grimm, Bernhardt and Ren were flies (usually <2mm in length) in the family Chloropidae. Dr Dan Bickel (Australian Museum) received the entire fly collection and noted that all the specimens photographed by Dr John Martin were females. A single fly may carry as many as two pollinaria on the back of her



*Corunastylis fimbriata*.

A single fly may carry as many as two pollinaria on the back of her thorax.

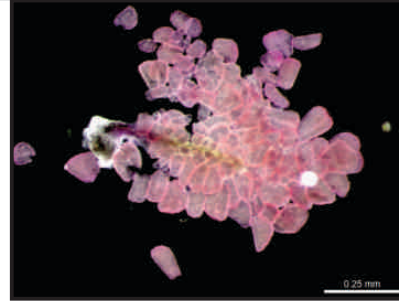
A drop of nectar is visible on the column wing lobe.

Photograph: Wendy Grimm.

thorax but one usually shows signs of erosion as it loses pollen packets (see below) as it is rubbed against a sticky stigma whenever it contacts an anther. As in so many of the orchid species studied by Charles Darwin, the drying stipe bends over suspending the actual pollinia directly over on top of the head of the fly aiming the pollinia balls at the stigma.

Photos taken by Dr Matt Renner at the Royal Botanic Gardens and Domain Trust confirm that *Corunastylis* and

*Genoplesium baueri* pollinia are sectile, not mealy or massulate. Each pollinium subdivides into a series of overlapping shards or scale packets. Each pollen packet is then composed of dozens of interlocking pollen grains. Looking at this photo on the right, they are not naturally pink but were stained with Calberla's fluid to bring out the natural sculpturing in the individual grain walls. What draws these insects to the flowers of midge orchids as the pollen is, as usual, not edible? Dr Ren has used battery-operated motors to extract scent from bagged flowers. This is not destructive as the collection process is completed while flowers remain on their respective stems. The scent is washed out with hexane, bottled, and will be analysed at the biochemistry laboratory in Yunnan. However, we report for the first time of a new, nectar site in *C. fimbriata*, *C. ruppilii* and *C. filiformis*. Fluid is produced at the tips of each of the opposite, most elongated, upper, column wing lobes. Flies imbibing the fluid then temporarily regurgitating it have been observed and photographed. Dr Bernhardt plans to examine these lobes back in St. Louis to determine whether it is a true, multi-tissue, nectar gland or a simple nectariole (a



Each pollen packet is composed of dozens of interlocking pollen grains. Photo courtesy of the Royal Botanic Gardens and Domain Trust, Sydney.



Battery-operated motors to extract scent from bagged flowers.

Photo: Peter Bernhardt.

stomate or pore cluster modified to secrete fluids instead of gases).

To determine whether these species self-pollinate in the absence of insects, flowering stems of three species were bagged in bud. Our team recommends the use of organza or bonbonniere bags braced with simple bamboo skewers. Initial results show that rates of self-pollination, followed by fruit set are almost negligible. However, a limited number of



Bonbonniere bags braced with bamboo skewers.

Photo: Peter Bernhardt.

insect-pollinated stems were also collected, fixed and pickled. Most were victims of stem-chewing insects (including copulating grasshoppers!), or digging wallabies, or scratching brush turkeys, and were harvested by the team before they wilted. These rescued flowering stems have been sent successfully to the Bernhardt/ Meier laboratory at St. Louis University for fluorescence analyses to determine which pistils show evidence of pollen grains germinating/penetrating stigmas and pollen tubes penetrating ovaries and entering ovules. Although we often found *C. fimbriata* flowering at the same site with one or more other species, we found no evidence of hybridisation or intergradation. We are hoping that one, or more, of the pickled inflorescences sent to St. Louis will show evidence of aberrant tube development, a sign that co-flowering *Corunastylis* species reject each other's pollen if deposited by a fly transporting pollinia from one species to a second. As flowering stems exposed to flies were also tagged in each species and at each population, the conversion rate of flowers into capsules was recorded. As capsules were allowed to dehisce at maturity, seed counts were recorded under the microscope. The seed counting was of ratios, but no attempt was made to do total seed counts per capsule.



We subdivided capsule contents into three groups; whether the seed coat contained an embryo, seed coats with half-size embryos and seed coats containing an embryo that filled the seed sack. Previous reports that it takes five months for *C. fimbriata* to mature and release its seeds did not comply with this study. We found that capsule dehiscence occurred about a month following flowering.

In many *Corunastylis* species, the hinged labellum trembles in the lightest of breeze. Dr Ren recorded this process in two species and results may be viewed on Youtube. In our experience, the labellum of *C. ruppii* does not tremble unless the peduncle is gently tapped with fingers or a probe.

<https://www.youtube.com/watch?v=CKYN7fMrRpw> = *C. fimbriata*

[https://www.youtube.com/watch?v=TNLX1\\_VsoGI](https://www.youtube.com/watch?v=TNLX1_VsoGI) = *C. ruppii*

The significance of trembling is still not understood. If this movement attracts chloropids why don't all species do it? Perhaps some species release their scents as irregular "puffs" as the labellum covers the column and hides the nectar glands until the wind separates the hypochile from the column.

## WHAT IS IN MELBOURNE'S WATER?

Richard Austin

Details of the elements found in Melbourne's water. These figures are based on Cardinia Reservoir.

Figures are milligrams per litre.

Iron -07  
Manganese - 0.004  
Fluoride - 0.85  
Boron - less than 0.05  
Cadmium - less than 0.05  
Calcium - 4.2  
Copper - 0.02  
Magnesium - 1.3  
Potassium - 0.7  
Phosphorus - 0.007  
Zinc - less than 0.01

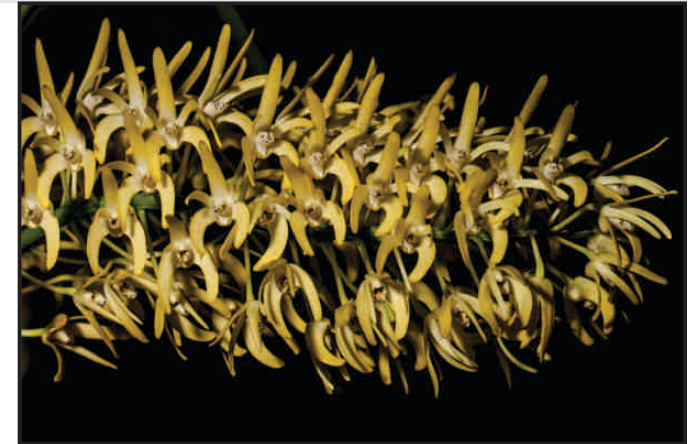
So tap water actually contains the majority of the elements found in various fertilisers. This isn't to say they are at the ideal levels required, but nonetheless they are present. What's more all these elements represent less than 4% of the essential elements required to support plant growth. The major elements are carbon 45%, oxygen 45% and hydrogen 6% all of which come from the atmosphere and water.

## AN IMPRESSIVE FLOWER COUNT

Helene Wild with photographs Alan Firth took at the 2015 Spring Show.



*Dendrobium speciosum* var *hillii*.



*Dendrobium speciosum* 'National White' x 'Windemere'.



*D. Lynette Banks* x *speciosum*.

*Dendrobium speciosum* is a distinctive species with large, robust pseudobulbs and big leathery leaves. It is distributed from Victoria's far east and along our eastern seaboard to north-eastern Queensland, making it Australia's most widely distributed epiphytic orchid species.

The King Orchid, as it is commonly called, grows in a range of habitats. Some forms prefer a penthouse view high in the canopy of trees, while other forms have taken up residence on boulders, escarpments and cliff faces. Depending on the form, flower colour can be white, cream or yellow. Some forms carry hundreds of flowers displayed on "fox-tail" racemes.

In addition to its floral attributes, *D. speciosum* is one of our easiest to grow epiphytes.

Taking all these positives into consideration, it's no wonder *D. speciosum* is beloved by hybridisers.



*D. (Nugget* x *speciosum)* x *speciosum*

*D. Avril's Gold*, *D. Warringah*, *D. Aussie Artist*, *D. Anne's Rainbow Surprise*, *D. Graham Hewitt*, *D. Lynette Banks*, *D. Gracious Cascades*, *D. Wonga*, *D. X delicatum*, *D. Hilda Poxon* and *D. Star of Riverdene* are just a few of many favourite hybrids with *D. speciosum* in their parentage.