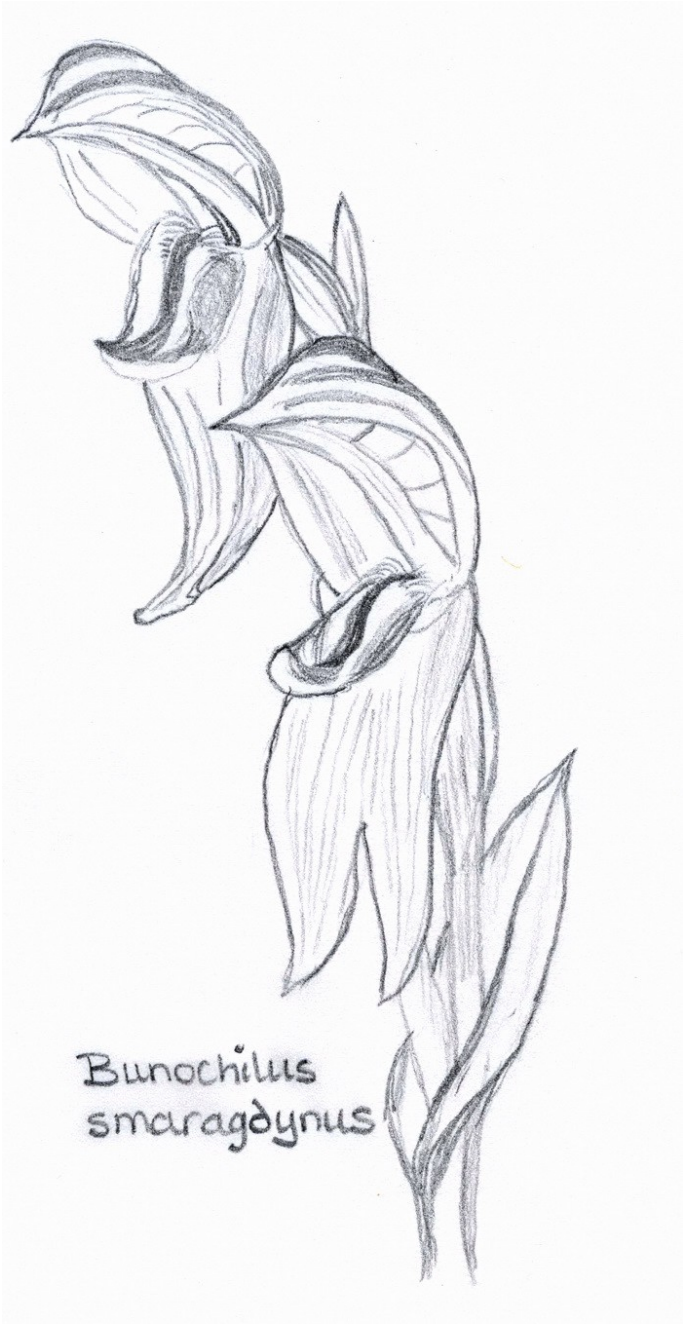
Journal
of the
Native Orchid Society
of
South Australia Inc



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NATIVE ORCHID SOCIETY OF SOUTH AUSTRALIA

PO BOX 565 UNLEY SA 5061

www.nossa.org.au.

The Native Orchid Society of South Australia promotes the conservation of orchids through the preservation of natural habitat and through cultivation. Except with the documented official representation of the management committee, no person may represent the Society on any matter. All native orchids are protected in the wild; their collection without written Government permit is illegal.

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JOURNAL OF THE NATIVE ORCHID SOCIETY OF SOUTH AUSTRALIA INC.

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CONTENTS THIS JOURNAL

The Native Orchid Society of South Australia meets every 4th Tuesday of the months February -November

NEXT MEETING 23 FEBRUARY 2010

Tuesday, 23 February, St Matthew's Hall, Bridge Street, Kensington. Meeting starts at 8:00 p.m. Doors to the hall will be open from 7:15 p.m. to allow Members access to the Library and trading table.

The speaker is Graham Zerbe on the AOC Conference.

DIARY DATES

23 February 2010	First meeting for 2010
March 7th	Field Trip Planning meeting
March 23rd	AGM

NEXT COMMITTEE MEETING

Tues, 2nd March at the home of Bodo Jensen**.** Meeting commences at 7:30 p.m.

FOR YOUR INFORMATION - NOSSA NEWS

REMINDER

SUBSCRIPTIONS ARE DUE NOW

N.O.S.S.A. FIELD TRIPS

Field trip planning for 2010.

All those interested are invited to attend at 38 Portmarnock St, Fairview Park on Sunday 14th March, 4:30p.m.
Please bring what you need for a barbeque and shared meal.
If unable to attend emailed suggestions (either to Bob Bates or the Secretary) for trips will be welcomed.

JUDGES MEETING

The next NOSSA judges meeting will be on Saturday March 6 commencing at 9.30 am at 18 Cambridge St, Vale Park.

GARDEN EXPO

2010 Garden Expo Adelaide
Adelaide Showground, Wayville
Sun 6th – Mon 8th March 2010

ARTICLES/ITEMS FOR THE NEXT JOURNAL

Closing date is Friday 6th March

Growing *Phaius tankervilleae*

Les Nesbitt

Australia's largest terrestrial orchid is also known as the Queensland swamp orchid. It grows in full sun in open swampy areas where the water table is close to the surface so that the roots never dry out. The soil is peaty or muddy. The summers are humid with heavy rain from December to February. Winters are drier and less humid with more sun. Remember that in the tropics the days are never longer than 12.5 hours. In Adelaide in midsummer the day is 14.25 hours long. Those last 2 hours on hot days is when burn damage is done.

Phaius are large plants with wide pleated leaves of thin substance that burn easily in Adelaide. The flower spikes grow from the side of the bulb inside the outermost leaf and remain hidden under a leaf until almost as tall as the leaf. Flowering is progressive from November to December. Flower spikes can be up to 1.2m tall. The large flowers are 100mm across, white on the back, and brown to purplish on the inside. The lip is pink. Each bud is protected by a sheathing bract that drops off just before the flower opens.
A large plant carrying 3 or more spikes is a sight to behold. Unfortunately a plant this big will not fit in a car.

New shoots appear in November at flowering time and take almost a year to mature. The best time to repot is just as flowering is finishing. The old flower spikes can be cut into 3 node lengths and half buried in the pot. Sometimes they shoot and make extra small plants. Queensland growers lay the cut spikes on a bed of spagnum moss and shoots grow from each node. This method has not been successful for me in Adelaide. I reuse the old mix, even if it is broken down to black mush, and add new bark *Cymbidium* mix plus some blood and bone. *Phaius* bulbs are fleshy and last only 2-3 years. Plants should be divided or potted-on before they push the pot out of shape.

I used to grow my plants in a shady heated glasshouse but they grew spindly and were prone to rot. After seeing another grower's tough healthy plants, I moved my plants into the shadehouse against a north facing brick wall but under the eaves of the house. They are next to the tap so that I can water them daily in summer. Remember to never let the roots dry out. Pots can be stood in a saucer of water in summer. *Phaius* are heavy feeders and seem to like organic pellet fertilizers. I also use soluble fertilizers poured over the leaves and into the pot. I have 2 layers of 50% shadecloth over the plants in summer and one layer in winter. My plants are now tough and green. It is normal in Adelaide for the ends of the leaves to go brown and die back. This is probably due to our salty tap water. I trim the leaves before showing my plants. For this summer I have installed 10 misters in the shadehouse that come on by timer for 3 minutes every hour when the temperature is higher than 35'C.

Any orchids with wide pleated leaves attract scale and *Phaius* are no exception. I use metho on a cotton bud or drench with confidor to control scale and ants that bring scale. Green looper grubs appear in October and other times to chew unsightly holes in the leaves. Look under the leaves for the grubs.

Climate Change and South Australian wild orchids. R. Bates

Introduction:
The effect of climate change on South Australian orchids has been discussed and written about since the 1980's (Bates 1988). 'Man made' climate change began with the Industrial Revolution two hundred years ago when an increased amount of carbon dioxide, methane and other industrial greenhouse gases began to enter the earth's atmosphere. At about the same time in Australia our native forests began to be cleared at an alarming rate, replaced by a thin cover of pasture and crop species much of which stopped taking in carbon dioxide completely over summer. Soon afterwards the destruction of rainforests around the world increased. Oxygen production and carbon dioxide absorption by rainforest trees therefore fell dramatically and the percentage of carbon dioxide in the atmosphere began an ever accelerating increase. Human population too increased exponentially while the population of wild creatures decreased at a faster rate, the vegetation cover of the earth declined. Desertification due to man's activities begun 4000 years earlier continued to increase. Pollution, higher temperatures and increased acidity of the oceans saw decreasing biomass there too. Humans demanded ever more fuels to improve travel and home comforts while material wealth increased.

Early NOSSA observations:
In the early 1980's NOSSA members began to notice that average cool season rainfall in southern South Australia and southern parts of WA was decreasing. Could this have been due to rising temperatures caused by the Greenhouse effect?
NOSSA certainly thought so and if this was the case all our orchid species were under threat because of it. It was a case of double jeopardy: if loss of habitat didn't wipe out the orchids its effect on climate would.
It has taken nearly twenty years for the Australian Government to accept something that NOSSA members accepted in the 1980's.
There is of course another double whammy. Higher temperatures mean not only <u>lower</u> rainfall but also <u>increased</u> evaporation. Orchids may not cope with both.

Why Climate drying may wipe out most South Australian native orchids:
South Australia is the driest, flattest of the Australian states with the highest percentage of habitat loss occurring in the orchid rich southern parts.
Orchids were already at the limits of drought tolerance before climate drying began.
There is simply nowhere for orchids to move as higher temperatures and drier climate affect their survival..
They can not move southward into cooler, damper climes because of
A: the island effect, whereby all surviving populations are restricted to islands of native vegetation and are unable to cross farmland.
B: soil types toward the coast are different from those inland and each orchid species has evolved to require a particular soil type.

Orchids cannot move to higher altitudes because the greater area of SA where they grow is broad plain and where there are mountains the higher parts tend to be of very small areas with skeletal soils. In the meantime loss of climate-sensitive orchid pollinators and native mammals to recycle leaf litter and open up dense bush, an ever growing pestilence of smothering feral weeds and animals and degenerating soil structure and microflora are wiping out remaining orchid populations.

Today: Bureau of Meteorology records for South Australia show that there has been a trend toward increasingly dry growing seasons in South Australia since the 1950's and at the same time increasing temperatures and lower humidity leading to increased evaporation. We in Adelaide are under threat of level four water restrictions this summer, with most of the state experiencing drought, now extending into a fourth year for many districts. The six months to March 2008 in South Australia has been the driest 6 month period on record, 2006 was the driest year on record in the orchid rich districts and the first 6 months of 2005 was the driest start to any year on record. What chance our orchids?

What we at NOSSA have observed in the last twenty years:
During the last three years it has been noted that the pastoral areas of the state have had an almost complete failure in orchid flowering and one suspects that whole populations have disappeared for no other reason than the hot dry weather. Elsewhere in the wheat belt the last two seasons have been extremely poor and late spring flowering orchid species failed completely. How many years of this before extinction of all but the commonest species occurs?

Likely effects on orchids
1: the orchid growing season is now shorter by an average of two weeks compared to the 1950's. In 2005 the season did not break until June even in the Adelaide Hills, in the past the season break occurred in April-May. On the plains in 2006 and 2007 the season was over for many orchids at the beginning of September.
2: most species now flower 1-2 weeks earlier. In 2007 *Arachnorchis leptochila* was found in flower at Cox Scrub CP at the end of August yet old trip reports in the NOSSA journal show that in the 1970's we had excursions to see this species in early November. *Note however that August 2008 was so cold that orchids flowered weeks later than usual.
Those species which seem unable to flower earlier simply abort their flowers due to drought or heat before their preferred flowering time.
3: orchids such as the delicate helmet orchids *Corysanthes* which can only grow in cool humid conditions now have such a short growing season that they often can not complete their life cycle. In 2007 for example most flowers were destroyed by temperatures of 30 degrees and low humidity in August within a few days of the flowers opening and in some cases before they opened.
Where spring flowered orchids have survived to flower the plants have been shorter, with smaller flowers, decreased pollination rates and more intense loss to grazing and thrip damage. Much of this has been written up in our NOSSA journal.
On the most recent NOSSA excursion to Wellington on our cool south coast on Sept 9th 2007 all orchid leaves were dead at the time of our visit and most flowers of most genera had aborted. We could only imagine what it must have been like inland.
In 2006 for the first time since the formation of the society planned field trips have been cancelled due to drought. Winter flowered species other than helmet orchids have done better because evaporation rates are still low and dews help plants survive the decreased rainfall.

Conservation ratings:
I have this September revised the conservation ratings of any species which have failed to appear in any numbers in the last two orchid seasons. Several species not previously threatened are now obviously in short term danger and most must be threatened in the long term of 50-100years.

Reference: Bates R. (1988) 'The Greenhouse effect and the future of South Australian orchids' J. *Native Orchid Society of South Australia,* vol, 12 number 9.

Fran MacGillivray's Research into South Australian *Caladenia* sensu lato:

R. Bates

It was great to see a copy of Fran's latest paper on *Caladenia Systematics*. Fran is using DNA testing to show relationships in *Caladenia.* The paper was published in *Aust Plants Soc Journal* Vol 20 number 7: August 2009.

The most important result of her work was to show that *Petalochilus* the pink fairy orchids are not closely enough related to spider orchids *Arachnorchis t*o be regarded as the same genus. She chose the local forms of *Petalochilus carneus* to achieve this.

At the species level Fran (and Lachlan Farrington) worked with nine *Arachnorchis* species *A, cardiochila, A. colorata, A. leptochila, A. reticulata, A. rigida, A. stricta, A. tensa, A. tentaculata* and *A. valida.* Fran admits that not all of her material may have been correctly identified but what she has shown is that most *Arachnorchis* have only recently diverged and that *Arachnorchis rigida* and *A. reticulata* for example are not easily discerned from DNA sampling. This is interesting as the two are clearly separate species as evidenced by field studies, pollination strategies, morphology and colour.

As expected *A. cardiochila* is not closely related to the other spider orchids. Indeed observations made over the years by NOSSA members that the coastal forms of *A. cardiochila* are different from inland forms is backed up by Fran's DNA evidence and we may one day see these two treated as separate subspecies. Pollinator sampling is needed to show otherwise.

Until recently the northern green comb spider orchids from Clare were placed under *Arachnorchis tentaculata* from which they were removed about four years ago and placed tentatively with *A. tens*a, itself a poorly understood species which may actually be several taxa as treated in S.A. Fran's work shows that the large form near Clare is hardly separable from *A. tentaculata* but easily different from *A. tensa 'mallee'.* Of course we have to be careful here as it is possible that Fran's material from the mallee may have been *A. verrucosa* or even some undescribed taxon. I certainly never verified any of her determinations. Indeed Fran's results with *A. colorat*a show that her material belonged to several different entities. This is most likely due to mis-identification of specimens as some of her material purportedly came from locations where *A. colorata* is not known to grow.

This is a perennial problem with DNA testing: misidentification and mixed collections will always give wrong conclusions. As Fran noted in her report, some of her material was identified from leaves only. I would certainly not be accepting of any identifications made from leaves, especially as spider orchids often occur as several species at one location.

Some of Fran's observations are clearly erroneous ie her finding that '*A. leptochila* from Belair had the same haplotype as *A. tentaculata* from Kuitpo and indicates hybrid influence'. Clearly there has been a mix up here as the two have never been observed to hygridise, indeed the flower size is so different that no insect could effect a transfer of pollinia.

The most important aspect of Fran's DNA work is the support for Jones and Clements segregate genera of the super genus *Caladenia.*
Unfortunately it is not just a matter of using DNA to sort the taxonomy as there are other issues such as validity of types, interpretation of ancient documents and the like ..
However the most likely conclusion is that *Arachnorchis* is more acceptable than any other name. Lets hope that we don't end up with something like *Phlebochilus* replacing the delightful *Arachnorchis!* Yes this has been proposed by some authors.

It is only early days in using DNA to test relationships in South Australian orchids and I think NOSSA should support these studies wherever possible, but serious consideration needs to be given by DNA workers in having their material identified by the experts.

To those submitting articles with photographs included

Please note:

I have little choice but to omit some photographs that are inserted into word files as they are too large in file size. I am unable to remove those photos from MS Word and reduce the size as the Word format changes the pixel value of the photo rendering it almost unrecognisable compared to the original upon re-insertion.

By all means insert the photo so that I can see how you would prefer the article to appear but include the photograph in a separate file so that I can manipulate the pixel size and or quality level.

I do prefer to receive the photographs with a dpi of 300 and not reduced in pixel size. From that I will select the optimal resolution and size to complement the article and at the same time keeping the journal size to a manageable level.

Editor

Annual *Dipodium* and swamp sun-orchid summer excursion

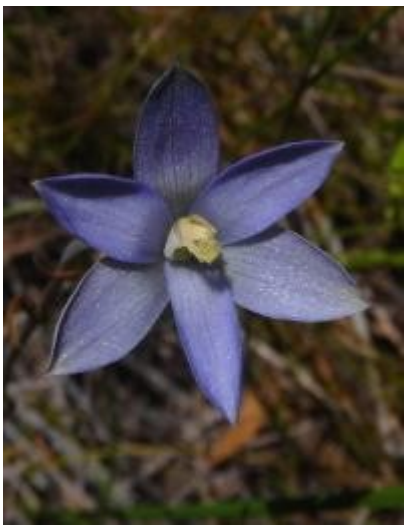
Bob Bates

More than a dozen NOSSA members and friends attended the annual Hyacinth Orchid special to Mt Lofty on Boxing Day 2009.
We met at the Garden gates at 9am but as they did not open til 10am on weekends (an oversight by our leader) we headed for the main lake in Stirling and instantly found lovely hyacinths by the score, from lake's edge to ridge top. Some were a metre tall but most were in bud and promised a spectacular display right through into February.
There were dark stemmed and green stemmed plants with flowers from pale pink to carmine with hundreds of butterflies around them in the 20 degree sunshine. One of the Lawrence family members found a plant with striped sepals, see image.
Dipodium pardalinum were still in bud so it was only *D. roseum* that the photographers zoomed in on.
All other orchids were in seed, lots of sun orchid species with seeds long released.

What is eating our hyacinth orchids now? About 10% of spikes had their flowers sucked dry by mealy scale-hoppers. These ghostly looking hoppers covered the stems of *Dipodium* with a mealy scale for protection. See image.

By 10am we were back at the Mt Lofty Botanic gardens top gates just as they opened and although we saw the same orchids as before, the spectacular views and crazy locations where *Dipodium* grew amazed us. One plant pictured was growing straight out of the bitumen on a side road; others grew out of the yellow clay banks at crazy angles, one had pushed through scorched black soil burned a few weeks earlier and one was in a pile of soil on a large fork in a tree. We had hoped to find the pure albino pictured in the March 2009 NOSSA journal but if present it was still in bud. The Mt Lofty Botanic Gardens is the best in South Australia and is about one third bushland very steep and uphill for our walk out.

At 11 am we parked at the Cleland Wildlife Park turnoff from Summit Road and scrambled down into a coral-fern bog, past the ruined gatehouse which had *Dipodium* right up to the front door and into the cold wet peat where we found several rare *Thelymitra circumsepta* in fat fruit and a single plant of the same with a single flower just closing after a traditional Christmas day blooming. This site is the only SA location for this species, the last sun orchid to flower in SA, more than six months after sun orchids were seen in flower on our winter/spring Wirrabara excursion.
Also present in the swamp here were leaves of *Prasophyllum australe* and *Microtis rara w*hich need burning or slashing to induce flowering.



Thelymitra circumsepta

These summer excursions where we see leafless epiparasitic orchids with twenty pink flowers on stems to a metre tall are always well attended and show how orchids survive in Adelaide's suburbs, albeit the more hilly ones. They also show that despite climate change orchids are survivors.

[Editors Note and apologies: Due to space restrictions some of the photographs included with this article only appear in the email edition of the journal.]

Hyacinth orchid growing through a bitumen road and one with mealy leaf hopper

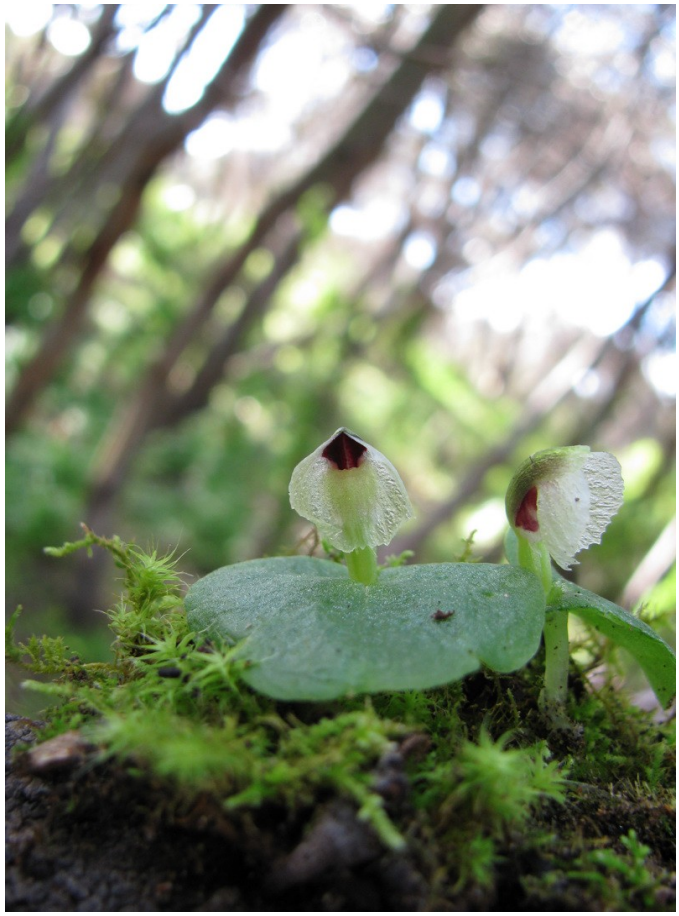
Striped Hyacinth orchid, image by RB

Local model, Gillian Antolini with hyacinth orchid, Mt Lofty

Images by RB

Dipodium roseum, softest pink, Stirling

Above: Nossa group on Boxing day trip



Right: Red-eyed ghost Photo B. Bates