JUNE 1979

OFFICIAL BULLETIN

W.A. NATIVE ORCHID STUDY & CONSERVATION GROUP (INC.)

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Hon. Botanical Adviser	Mr A.S. George
Bulletin Editor	Mr T.Wilson

The next committee meeting, owing to Alice being on holiday will be held at Lal Sheppard's residence - [redacted] on 3rd July 1979.

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The next general meeting will be held on the 6th July 1979 at the Department of Agriculture Film Room, South Perth.

The topic for this evening is a set of slides for identification and to be shown by Mr & Mrs Baumbaer.

Mr Alex George also hopes to be able to show slides of the underground orchid and its habitat.

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June Meeting - President's Report.

This meeting was well attended and with the finding of the underground orchid (Rhizanthella gardneri) at Mungilup, gave the meeting some life. Mr Alex George phoned from the area to report that he had found 14 more plants.

The motion that appeared in last month's bulletin concerning permits was again discussed at length and was then carried. In view of its importance to all members it is again repeated for your information:

That the W.A.Native Orchid Study and Conservation Group (Inc) will:

1) Leave it to the individual members of the Group to obtain such permits as may be necessary to comply with the laws and/or regulations governing the t ng of specimens of native flora.

2) That the group will draw its members attention to the laws and/or regulations current at any time and will emphasize the need to observe these laws and/or regulations at all times to protect the good name of the Group

It was also moved that a delegation be formed to meet the Minister for Conservation to discuss with him the new act. Sir Crawford Nalder to be included in the delegation.

There were several plants in flower tabled and they were: Leporella fimbriata (Hare orchid), Pterostylis vittata (Banded greenhood), Pterostylis rogersii and Caladenia drummondii (Winte spider orchid). Another Pterostylis yet to be named, grown by Mr Harry Lodge, was also tabled. This gives an indication that the flowering season has begun. Members are urged to bring in their flowering plants.

Mr Lal Sheppard gave a talk on flora reserves, this will be printed in next month's bulletin.

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The raffle was won by Mrs Pat Kierath. Two beautifully grown African violets, donated by M/s Linda Penny

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New Members

We welcome into the Group three new members:

Robert Manning [redacted]

Kiely & Jean Holt [redacted]

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Field Days Listed:

10th June 1979	Busy Bee. Smyth Road
1st July 1979	Meet Midland Railway Station 8.30 am - Destination - Mogumber object "Queen of Sheba" Thelymitra variegata. (Note: Mr Alex George reports that the Queen of Sheba is already in bloom in the area and that it is possible they will all be finished by 1st July - so be on time in case it is decided to change the destination by common consent.)

FRANKLAND RIVER BRIDGE - MUIR HIGHWAY

The Main Roads Department has advised that clearing for the new bridge across the Frankland River on the Muir Highway is about to begin. Members may remove orchids from the road alignment only up to approximately 2nd July. They should have their membership badges with them and contact the works foreman at the site before taking plants.

WHO WERE THEY? T.Wilson, Bulletin Editor.

Have you ever wondered who the people were whose names were given to some of our orchids?

The following list, by no means complete gives some of them:

Brown	Microtis brownii	Doutch	Caladenia doutchae
Rodgers	Prasophyllum rogersii	Drummond	C. drummondii
Robertson	Calochilus robertsonii	Huegel	C. huegelii
Purdie	Diuris purdie	Paterson	C. patersonii
Forrest	Lyperanthus forrestii	Menzies	C. menziesii
Mitchell	Prasophyllum mitchellii	Roe	C. roei
MacMillan	Thelymitra macmillanii	Mathews	Thelymitra mathewsii
Gardner	Rhizanthella gardneri		

PTEROSTYLIS ?

If you are interested (and wish to see your name in print) choose one of the names listed to research through your local or the state library and send me the article for publication in the bulletin. However to ensure that only one person is researching each name please let me know which you wish to do and I will publish a list in the next bulletin. In the event of two or more choosing the same person to research priority will be given on the basis of first received first allocated. If a person interests you,not listed above, or indeed any person connected with the study of orchids stake your claim to the name and let us have an article in the coming months. I will start the series next month with an article on Baron Sir Ferdinand Jakob Heinrich von Mueller 1825-1896. Remember however that the articles must be in your own words, you cannot just copy from a book as this would be breach of copyright. Ideally you should give a bibliography showing the source(s) of your material.

NATURAL HYBRIDIZATION IN CALADENIA

by S D Hopper
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Introduction

My interest in Caladenia hybrids began in 1973 when, as a science honours student at the University of Western Australia, I was undertaking a research project on natural hybridization in kangaroo paws. At that time Mr Kingsley Dixon drew my attention to the occurrence of natural hybrids between Caladenia patersonii and C. huegelii at Bayswater. I decided to have a close look at this population to compare and contrast the process of natural hybridization in spider orchids and kangaroo paws. The results of this brief investigation were written up in a thesis entitled "Natural Hybridization in Anigozanthos (Haemodoraceae) and Caladenia (Orchidaceae)".

Subsequently, I have maintained an interest in Caladenia hybrids and I have attempted to note details of any putative hybrids encountered in the field. I am keen on hearing of any hybrids encountered by the W.A.N.O.S.C. Group. At some stage in the next two years I plan to write up observations on the W.A. Caladenia hybrids in a form suitable for publication in the Australian Journal of Botany.

In the meantime, it seems opportune to present a brief summary of data presently at hand. Such a review may bring neglected areas of research clearly into focus, and will indicate directions for future study.

Natural hybridization has fascinated botanists for 200 years. Early work on experimental hybridization in Europe was instrumental in demonstrating that plants are sexual - it requires both pollen and ovules to produce seed in most species. Over the past fifty years, a resurgence of interest in natural hybridization has occurred in concert with the development of powerfully new insights on the process of evolution. It is now known that natural hybridization may play a significant role in plant evolution by either:

1) giving rise to new species
2) increasing the genetic variability of species and thereby allowing them to colonize new habitats or to persist in a changing environment
3) producing selective pressures that sharpen reproductive barriers between plant species.

Despite a 200 year history of scientific study on natural hybridization, many problems remain unsolved about the process and new discoveries continue to be made.

The Problem of Identification

In any study of natural hybridization, a central problem is being sure that plants with intermediate features are actually hybrids. Seven lines of evidence have been recognized by modern botanists that allow for the confident identification of hybrids when all are satisfied.

These include:

1) intermediate morphological, anatomical and physiological features

2) occurrence in the wild with both suspected parents

3) occurrence in disturbed habitats

4) partial or complete sterility

5) occurrence of insect pollen vectors that move freely between plants of both suspected parents in mixed populations

6) close agreement between the features of experimentally synthesized hybrids and putative natural hybrids

7) greater variability in the progeny of natural hybrids than in those of either parental species.

The last two lines of evidence perhaps provide the most compelling data for identifying natural hybrids, but the other lines of evidence are all worth investigating as well. In fact, most studies of natural hybridization do not include experimental evidence, and rest on inference from the first five criteria indicated above.

This is the case in Caladenia. It is now known that morphologically intermediate plants may occur in mixed populations of the following species pairs:

flava and latifolia
flava and marginata
flava and patersonii
filamentosa and "dorrienii"
filamentosa and roei
filamentosa and multiclavia
filamentosa and sigmoidea
filamentosa and cairnsiana
patersonii and huegelii
patersonii and lobata
patersonii and dilatata
patersonii and hirta
patersonii and longiclavata var rhomboidiformis
patersonii and radiata
patersonii and filamentosa

(Can members offer any additions to this list ?)

In most of these examples, the putative hybrids occur as isolated individuals that are uniformly intermediate in features. However, in some cases (e.g. patersonii and huegelii), the hybrids show a bewildering array of f[illegible] features, representing all combinations of the distinguishing characteristics of the two parental species. This latter trend suggests the increased variability which is known to occur in the progeny of hybrids.

My observations suggest that many of these putative hybrids do not necessarily occur in disturbed habitats, nor do they appear to have sterile pollen. Hence, we are left with the suggestive evidence that:

1) they do have intermediate morphological features;

2) they do usually occur in mixed stands containing both suspected parents; and

3) some populations do show great variability in morphological features.

Unfortunately, these lines of evidence are not sufficient for the confident identification of natural hybrids. There is the possibility that many putative "hybrids" may, in fact, be very rare species. Although this possibility seems unlikely in the majority of cases listed above, it would be well to keep an open mind on the matter.

Directions for Future Work

It seems clear that the most important area for future investigation is the experimental synthesis of Caladenia hybrids. Suspected parents of natural hybrids need to be cross-pollinated by hand in an enclosure free of insects so that known hybrids can be germinated and grown to maturity. The features of these synthesized hybrids could then be carefully matched with those of putative natural hybrids. It would also be valuable to germinate the seed obtained from putative wild hybrids to see how variable their progenies are.

Such an experimental approach is well within the means of members who have Caladenia species growing in pots. It is a simple yet powerful way of contributing towards knowledge on the natural hybrids, and the exercise of synthesizing your own hybrids would be horticulturally rewarding in its own right. I would be most interested in hearing of any successes achieved by members in this field.

Apart from experimental work, much remains to be done in the field before a satisfactory understanding of hybridization in Caladenia is obtained. The list of possible hybrids given above is by no means exhaustive. There are probably other putative hybrids awaiting discovery.

Perhaps the most fascinating field of research deserving attention is the role of pollinating insects in natural hybridization. It is well known that discriminating pollen vectors provide the most important means of reproductive isolation between most orchid species. Dr Warren Stoutamire has established that the spider orchids fall into two main groups - those pollinated by wasps through pseudocopulation (e.g., C.roei, C.lobata), and those pollinated by bees (e.g., C.patersonii, C.filamentosa). Yet putative hybrids have been recorded between members of these two groups. How specific are these insects in the choice of orchids they visit? How do insects behave in mixed populations containing two or more Caladenia species? How often are putative hybrids visited by insects? These questions deserve careful study by patient observation in the bush.

Caladenia huegelii provides an interesting enigma among the spider orchids. It has some features typical of bee pollinated species (e.g., calli arranged in rows rather than in a central dark mass) and other features typical of

wasp-pollinated species (dark red tip to the labellum, clubs on petals and sepals). Does this combination of characters suggest a hybrid ancestry? what insects pollinate C. huegelii ? Further research on this species could well shed valuable insights into the role of natural hybridization in orchid speciation.

CULTIVATION OF CALADENIAS FROM SEED

By Mr R. Bates

South Australian Member

The recent progress in flasking of terrestrial orchids does not appear to have extended to the Caladenias (Western Australia's major orchid genus.). Fortunately the Caladenias are easy to grow by a far simpler method —

Collect seed pods when they have begun to turn yellow (just before they open). This is tricky to achieve in the bush and it may be a good idea to use a rubber band to keep in place a small paper bag over the pod to save the seeds. It is easy enough in the orchid house as this ideal picking period lasts about 7 days. The pods are placed in a sealed envelope in a dry place and forgotten until the next March or April.

The pods are then broken open and the seed spread on top of a pot which contains tubers of any common local non-colony forming Caladenias. (Preferably however a species similar or the same as the one you are seeding). Terracotta pots are ideal. It is best to use a gravelly soil straight out of the bush. The seeds are then covered with bush leaf litter to a depth of about 1-2mm. It is best to use a leaf litter made up of uniform very small leaves like chopped Casaurina or even pine needles..

The young leaves of the Caladenias already in the pot should not yet have emerged when you sow the seed.

The importance of cleanliness at all stages must be stressed. Wash hands with germicide before collecting pods and before sowing seed as well as when putting soil in pots and handling tubers. Dirty hands are the commonest way that pathogenic fungi are introduced to pots.

Hopefully natural rainfall will keep the leaf litter damp. Complete drying out to the top of the soil on which you sowed the seed would be fatal to the seedlings. Water by hand if drought conditions prevail.

Do not sow seed that is white or yellowish in colour as it is either unripe or not fertile. Caladenia seed is brown or black. The tiny seedling leaves will appear about late August.

Last year I had the thrill of seeing a pot of Caladenia rigida, (a rare South Australian endemic) with 100 seedlings from 3 seed pods sown and 30 seedlings of the almost extinct Caladenia gladiolata from a single pod.

Theoretically with some rare species, one grower could produce more plants in a single year than there were in the bush.

This year I have sown seed of some very unusual home made crosses. I was surprised that seed was even set with some of the inter-section crosses. Only time will tell if it was fertile.

The most important points again:

1) Cleanliness at all stages
2) Use of fresh bush soil for each sowing
3) Leaf litter to cover seed, not soil.

The seedlings should flower in their 3rd year.