

ASGAP INDIGENOUS ORCHID STUDY GROUP

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Pauline is away this month attending the birthday of our only grandchild in Brisbane, where we have three married daughters, then going on with them to visit her siblings in N.S.W. That leaves me with an open palette for this edition, which means no pretty colour pictures (or italics) this time. We hope to return to colour next issue and to feature more of Kate Vlcek's impressive work. This is our 41st Newsletter and looking back through previous years I see that our style and content have changed over the years: new technology and Pauline's computer expertise has improved the presentation, but content always depends on feedback and contributions from members. As we send off each edition I wonder just how many will be opened and read with interest, or how many will be cast aside for later reading then forgotten, or simply filed, unread. We get very little comment, favourable or otherwise, on our efforts; we welcome both sorts.

One reaction that pleases us is the effort that various state study group liaison officers go to to publicise the work of the various study groups. Most state SGAP/APS bulletins feature a page: "News from the study groups" which include short precis of recent study group newsletters. This gives the group's activities a wider audience and hopefully, new members. Our sincere thanks to those state officers who perform this service to us.

Some follow-up on last newsletter: The front-page colour picture really grabbed attention: I think that there's some relationship there to the major article later in this newsletter.... The Pencil Orchid that had its roots eaten off by Spangled Drongos has not responded to our care, but Pauline says an orchid is never dead until its returned to dust. The Drongos, by the way, have now taken to chopping leaves and immature fruit from a nearby *Evodiella muelleri* (*Melicope rubra*) shrub.

Pauline's *Spathoglotti* have gone into a bit of a sulk after having all their inflorescences monstered. I have a magnificent hybrid *Spath* in a 15 inch pot. It is about six years old and flowers almost year round. Inflorescences arise from a thick peduncle almost a metre high, and display up to five, 4 - 5 cm wide, flowers at a time. These open as maroon speckled buttercup colour with a cruciform labellum displaying bright golden calli. The column hangs enticingly over the wasp-waisted landing platform. The colours fade on the second day and the flower falls on the third. The plant presently has three inflorescences out and four more on the way. Two other peduncles have been sliced in half, probably by a giant grasshopper, as they were on the point of opening. I put one of these in a bottle of Thrive solution with a bit of added stale beer. The second I put in a bottle of diluted lees from the home brew beer keg - if it stimulates me, what will it do to an orchid bud? After a week they're both like the fellow who swallowed a two bob piece - no change! The flowers and buds require constant care; not only grasshoppers, but ants, spiders and butterflies find them attractive. Small meat ants swarm up the peduncle and over the buds but seem to do no damage. There are currently two beautiful white Crab spiders (*Sidymella*

sp.?) resident in the petals. These are reputed to bite readily and the bite can be painful but they have never bothered me. I note today that the larger spider has killed a little black native bee from the colony in our telephone junction box under the verandah. If only they and the spiders would shoo off the butterflies they would be earning their keep. The pot lives outside the bathroom window where it can be admired many times a day and surveilled for visiting Black & White Tit butterflies (*Hypolycaena danis*). These assiduously lay their sticky pinhead size white eggs on petals, buds and peduncles in lots of about five. If not picked off they rapidly hatch into small chameleon grubs that are hard to see and which burrow into the developing bud and destroy the whole inflorescence. Eternal vigilance is the answer to butterflies that take such liberties. Is there any way to repel these pretty little creatures?

I reported in last newsletter on an experiment in sowing *Cymbidium madidum* seed in various fern peats, on 8 Nov '05. Now, near mid-March, we have : Filmy ferns, *Ageratum*, *Commelina*, *Phyllanthus*, *Impatiens*, Grass sp., and a little fig seedling that I suspect is *Ficus pleurosperma* which will one day become a very large tree. But: no orchid seedlings; hope yet springs eternal on the matter.

And now, this has nothing to do with orchids but concerns one of the volunteer plants in my fern peat: *Commelina cyanea* is widespread in Australia, a trailer with brilliant blue flowers. The genus is named after Jan Commelin and his nephew Caspar, who were Dutch druggists (I am an Aussie apothecary) and medical botanists in the 17th century. *Commelina* flowers have three petals and the great Linnaeus wrote in *Critica Botanica*: " *Commelina* has flowers with three petals, two of which are showy (Jan & Caspar) whilst the third is not conspicuous (Caspar jr.) from the two botanists called Commelin, for the third died before accomplishing anything in botany. "

Isn't it wonderful that such a little semi-weed can give us an instant connection to great men of botany three hundred years ago?

The above snippet comes from a book published by Amphion Press (University of Queensland), written by Professor/Doctor/Major General John Pearn. Title is "Doctor in the Garden - Australian Flora and the World of Medicine". It is a lush book, heavily illustrated, and gives the stories of people involved in medicine after whom Australian plants have been named. Quite a few orchids are mentioned. I have always been fascinated by the story behind a plant or place name. Often names were given because of a fanciful resemblance to another, better known, or to honour a person who may have been the explorer's benefactor (or who could be induced to become one) or simply a person whose memory was worth recording for posterity.

There is a piece of the original London Wall preserved near (I think) Tower Hill railway station. One can kneel beside it and put one's hand on the brick and mortar where a Roman soldier/mason's hand had placed it, perhaps two thousand years ago. Forty years ago I scrambled over a choked moat and was able to do the same thing on the ancient city walls of Chiangmai in northern Thailand. Who needs a Tardis for time travel? In the same way, last year I admired the flower of an orchid growing on the high wilderness top of Mount Lewis in the ranges behind Daintree National Park. *Dendrobium fleckeri* was named after Dr Hugo Flecker (1884 - 1957). He is also honoured by having his name attached to " the world's most venomous creature, *Chironex fleckeri*" and to Cairns' Flecker Botanic Gardens. These three disparate items reflect the many interests of Dr Flecker's life. Our Cairns Branch SGAP meets at Flecker Botanic Gardens. Dr Flecker was a pioneer in the use of radiology and radiotherapy; he lived and practiced in Cairns from 1932 till his death in

1957 and was instrumental in the acquisition of knowledge of many tropical Queensland plants and animals, particularly those dangerous to mankind. He is also commemorated in the name of another orchid, *Liparis fleckeri*, which also grows on Mount Lewis. So, a name spelled in humble lower case can be the key to a personality of compelling interest.

Dr Pearn's book is filled with such stories; I'll add a few more Australian orchids named after medical people:

Acianthus ledwardii: Ledward's Great Orchid. This is one of the little (in spite of its name) mosquito orchids, a terrestrial that grew near the coast at Burleigh Heads in S.E. Qld near the border. The plant is probably now extinct, due to "development". I knew this area well in the late 1950's and could recognise nothing when passing through a year or two ago. Dr Colin Ledward (1903-1963) practiced as a G.P. in Burleigh Heads and was an indefatigable searcher for new plants great and small. He was an associate of orchid luminaries Rev. Rupp and W.H. Nicholls in a time only a generation ago when disinterested scientific enquiry had not succumbed to modern materialism.

Dendrobium beckleri: I quote from Dr. Pearn: "This beautiful epiphyte grows on rainforest trees throughout Queensland and New South Wales. It commemorates the life and works of Dr. Hermann Beckler (1828-1914) who practiced medicine at Ipswich and Warwick in Queensland, and who undertook significant geographic and scientific explorations in the Murray-Darling region of N.S.W. This hardy orchid, with its cylindrical pseudobulbs, hangs its great pencil-like clusters from the tallest of the rainforest trees." Dr Beckler was born in Germany and in 1860 was appointed (as Doctor) to the Burke and Wills expedition, but foresaw the problems in store and parted from them. A number of other plants are named after him.

Glossodia brunonis. Purple enamel orchid. Named after Dr Robert Brown (1773-1858) "The Father of Australian Botany" and "one of the scientific doyens in the history of botany". Dr Brown was a Scottish military surgeon with an interest in botany. He was a friend of Sir Joseph Banks, who offered him the post of Naturalist with Matthew Flinders' expedition around Australia on H.M.S. Investigator. His immense works included, on this trip alone, the description of 120 new species of Australian orchids. The genus *Glossodia* was named by Dr Brown and refers to the tongue-shaped calli at the base of the labellum. *Glossodia* are terrestrials with brightly coloured flowers which occur widely along eastern Australia's coastal ranges. I can find no information on the eponymous *Glossodia brunonis*, but a number of trees, ferns and shrubs also commemorate his memory in Australia.

I was going to leave it at that, but I've made a discovery: The SGAP Qld regional Bulletin, March '06 has Lorna Murray's description of a beautiful ASGAP pre-conference tour in W.A. last year. in part: "At all stops on the tour there were new species to identify. Some of the most striking were the ground orchids, including many species of *Caladania* and the brilliant blue Enamel Orchid, *Elythranthera drummondii*." Aha!! Enamel Orchid! A search of Jones reveals that *Elythranthera* were split from *Glossodia* in 1963, and *Glossodia brunonis* is now *Elythranthera brunonis* "after Robert Brown". They occur only in S.W. Western Australia, so I could have searched the eastern coastal ranges forever without finding a *Glossodia brunonis*.

That's it for this issue. This should be the last page, but I've written in a disjointed fashion and due to my inability to shuffle pages on my Word Processor the next three pages are my pollination article. I do hope that you can follow it all, and that you have found something of interest.

TEMPTATION, TRICKERY & ENTRAPMENT

By:
Don Lawie

Pollination Techniques of Orchid Flowers

The continuation of Life on Earth is dependent on species propagation. Continuing Evolution has devised numberless methods to achieve this aim and the variety is greatest in the plant world. Simple vegetative reproduction, though unspectacular, is effective, but results in little variation. Sexual reproduction is the method of choice in the animal kingdom, and is also practiced by most plants. Some plants may have distinct males and females, but most carry both sexual parts in their flowers. The non-flowering plants such as ferns have what could basically be termed a sexual phase in their complicated reproductive cycle, and the joining of characteristics of two parent plants ensures that the progeny can continue to progress along the evolutionary scale.

The basic plant sexual reproductive process consists of the movement of "male" pollen to a "female" stigma, from where the cells of the ovary are fertilised and seed/fruit production commences. Methods of pollen transfer can be very simple, such as the Grasses which produce massive amounts of pollen grains and release them to the air to be carried by the wind to a receptive stigma.

The so-called "higher plants" are not so free with their precious reproductive material and have devised specialised and more effective means of pollen transfer. Our Study Group interest is with Native Orchids of Australia, and orchids have evolved a wide variety of means of pollination.

One of the characteristics that distinguish orchids from other flowering plants is the construction of their pollen. Instead of many loose grains, orchid pollen grains are compacted into pollinia which occur in pairs connected by a sticky caudicle and protected by a pollen cap. A pollinator must displace the pollen cap and this causes the caudicles with attached pollinia to adhere to a chosen part of the pollinator's body. It is then removed by the equally sticky stigma of the recipient flower and the very large number of pollen grains in each pollinia ensures a correspondingly large number of resultant seeds in the fruit.

It could well be said that Homo sapiens employs temptation, trickery and entrapment to ensure that their particular method of "pollen transfer" ensures that the best specimens of male parent match the best of the females - at least in the eyes of one or other, or both of them! The Family Orchidaceae uses the same devices with the same shameless fragrance as Humans, and perhaps that accounts for the predilection of some humans with the sexually alluring aspect of orchids : the very term "Orchid" originally referred to the assumed appearance of orchid roots to human gonads. The traditional offering of a perfumed and gaudy orchid flower to a debutante by her partner is a thinly veiled invitation to her to indulge in a session of vigorous pollen transfer to conclude the evening.

Not all orchid species indulge in such activities; some have a life so short and so busy that they have no time for frivolities and even though they produce a flower with all the necessary parts, they simply self-pollinate to produce fruit and seed and then get on with the serious business of maturing and dying. *Epipogium roseum*, the Leafless Nodding Orchid, is one such. It

spends most of its time under the ground feeding away with the help of symbiotic fungi and then when the summer storms arrive it appears above the surface. *Epipogium* doesn't bother to grow leaves or attract pollinators; it simply self-pollinates, sets seed to cast into the air, and in a matter of days returns to the earth. An epiphyte of the Australian Tropics, *Eria eriaoides*, is careless of its host and thrives on both trees and rocks in the right climate. It flowers well, but makes a shy debutante and rarely opens her petals, preferring to self-propagate and save much mucking about.

The self-pollinating orchids are referred to as "primitive" species; the "higher" ones are those which indulge the full extent of trickery, temptation and entrapment. Are we again relating our human traits to plants?

The most frequent method of pollinator temptation is the use of seductive perfume. (Would a debutante use Chanel No 5 on her big night? Marilyn Monroe claimed that was all she wore to bed!). The perfume chosen by orchids is often attractive to humans also e.g. *Sarcochilus*, *Corymborkis* and *Plectorrhiza* flowers are very pleasantly perfumed. *Dendrobium speciosum*, the so-called Australian Rock Orchid, can have an overpoweringly strong and cloying perfume. A correspondent some years ago related an experience in a closed room filled with flowering *D. speciosum* during a flower show. After only a short time her olfactory system was so overpowered that she had to leave.

Not all orchid perfumes are attractive to us; it must follow that something that is designed to attract a gnat, mosquito or wasp will not also attract humans. Bees, however, are attracted to flowers by their colour and shape as well as their perfume. The small native bees that pollinate many native orchids pick the ones that are often favoured by humans e.g. *Caladenia*, *Dipodium*, *Dendrobium* and *Pomatocalpa*. Flies and mosquitoes are attracted to the flowers of *Liparis reflexa* by their "strong smell" and pollinate the flower quite effectively. Even lowly termites, those remarkable soft-bodied creatures that have neither eyes nor ears and can destroy houses, pollinate the reclusive underground orchid *Rhizanthella gardneri*, though what attracts them to the flower is debatable.

Temptation is usually accompanied by a reward: the pollinator receives a dose of nutritious nectar as well as a set of pollinia. In some cases this is provided in a very convoluted manner. *Angraecum sesquipedale*, from Madagascar, presents its nectar at the base of a long spur. Charles Darwin predicted that a pollinator for this orchid would have to be a hawk-type moth with a particularly long proboscis. The orchid's specific name is Latin for "foot and a half" - in today's language, 45 centimetres. The moth was finally discovered long after Darwin's death and was named *Xanthopan morgani praedicta* - the last bit to indicate that it was predicted before it was found. *Angraecum sesquipedale* attracts the *Xanthopan* moth by exuding a particular fragrance. Since the moth only flies at night the perfume is not released during the day. Other perfumed orchids which attract diurnal pollinators, on the other hand, only emit fragrance in daylight, and then not at all on a dull or rainy day when the insects are unlikely to be on the wing.

Some orchids eschew the simple routine of temptation followed by reward. These indulge in blatant trickery. Just as some humans utilise hair colour changes, facial camouflage and enhancement of body parts to lure a pollinator, so do some orchids develop bizarre colours and shapes in their inflorescence that are aimed at specific pollinators. Common names such as Flying Duck, Dancing Spider, Dainty Greenhood, Golden Beard, Gnat, Jewel,

Laughing Leek - yes, they're all fair dinkum names - give us an immediate idea of the range of floral adaptation that is aimed at tricking some insect into approaching. The insect is usually male and usually in a fever to achieve his own cycle of pollination. An orchid flower that resembles a female of his species - and sometimes even emits a pheromone identical to his Lady Love - is good enough for him to grapple. The orchid even times the release of the hormonal lure to coincide with the target insect's breeding cycle! By the time that he realises his error he has either received or donated a set of orchid pollinia and he goes on his way to repeat the process.

Not all orchid flowers that employ trickery depend on the pseudocopulatory method of attraction. Some simply impersonate the flower of a non-orchid plant that is pollinated by a common insect and depend on the law of averages for enough insects to visit them by mistake and complete the required transfer.

And finally, Entrapment. If all else fails, forget the rules of chivalry. The genus *Coryanthes*, from tropical America, exhibits this trait to the most spectacular extent. They are commonly known as "bucket orchids" since the labellum is elongated and deepened into a bucket shaped receptacle. When the flower is mature it exudes a liquid into this receptacle which attracts small bees. The bees become "extremely agitated" whilst at the bucket lip and some fall in. Their only way out is to swim to a conveniently located escape hole, from which they emerge to dry their wings and fly off, unaware that they are carrying a set of *Coryanthes* pollinia with them.

A similar method is used by *Pterostylis* orchids - commonly named Greenhoods because of the galeolar fusion of the dorsal sepal and petals. We have detailed the pollinatory technique of *Pterostylis* in detail in previous issues of this newsletter. Basically they entice the pollinating gnat or mosquito inside the hood, which closes on him. He is directed to an escape shaft by the use of light and as in *Coryanthes* he emerges adorned with pollinia. An interesting extra with *Pterostylis* is that the hood remains closed for some time after the gnat has flown and this is thought to ensure that the plant is not pollinated by its own pollinia.

Orchid entrapment methods bear some resemblance to those of the carnivorous plants such as *Drosera* and *Nepenthe* but there is an important difference: with orchids, the insect always escapes, and no orchid is carnivorous. If consumed, the insect would not be able to carry out its important duty of carrying pollinia to another flower.

It could be argued that orchids have developed a symbiotic association with the most terrible and destructive species that has evolved on our planet. Many specimens of *Homo sapiens* have become enslaved by species of orchidaceae in recent centuries. They have travelled the world in search of orchids, transported them across continents and devised extremely complicated and time consuming methods of ensuring their propagation and development. Hybridisation has accelerated natural selection to produce a plethora of new forms and genera which would have never occurred by the natural process.

Are we, then, who study and admire and grow orchids, the ultimate pollinator that they control, and do they copy us or do we copy them in our gyrations of Temptation, Trickery and Entrapment??