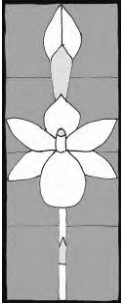


THE NEW ZEALAND NATIVE ORCHID JOURNAL

#105





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November 2007 ISSN 1177-4401

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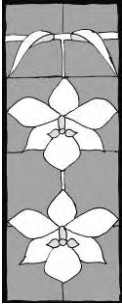
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EDITORIAL: IAN ST GEORGE

I ponder pollination...

1 Flowers of *Acianthus sinclairii* (cover picture) remained open for six weeks in a vase in my study before shrivelling. Is *A. sinclairii* capable of selfing? If not it would be something of an exception among NZ native orchids.

Structurally it is believable: the pollinia in the anther cap are separated from the downward-facing stigma by a prominent double rostellar shelf, and appear to be attached to the back of the rostellum, which may be a viscidium. Bruce Irwin's drawings show this clearly (opposite page). Pollination did not occur.

In my shrivelled flowers, the pollinia were held secure in a 3-lobed box made up of the two sides of the anther cap and the hardened stigma.

2 Anther cap retention is said to promote cross-fertilisation.

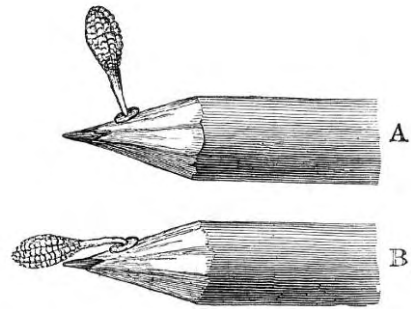
Many flowers of *Gastrodia* "long column" plants I saw in the southern Wairarapa had their anther cap and pollinia missing. In those flowers which still retained them, the anther cap was easily dislodged, containing its pollinia.

Peter and Johnson [1] examined anther cap retention in South Africa, and reviewed some of the adaptations orchids use to reduce the likelihood of self-pollination. Three of them use delay to reduce the availability of pollinia to the flower, or plant, they came from...

(i) One adaptation is the change in orientation of pollinaria

following removal. Freshly removed pollinaria are oriented so that if the pollinator immediately revisited the flower, or other flowers on the inflorescence, the pollinia could not be deposited on the stigma. It is only after the caudicles or stipes change their shape after a specific interval that the pollinia are correctly oriented to strike the stigma.

Darwin observed that process and illustrated it for *Orchis mascula*.



The pollinarium of *Orchis mascula*.
A. when first removed; B. after a period.
From Darwin C. Fertilisation of orchids, 1904.

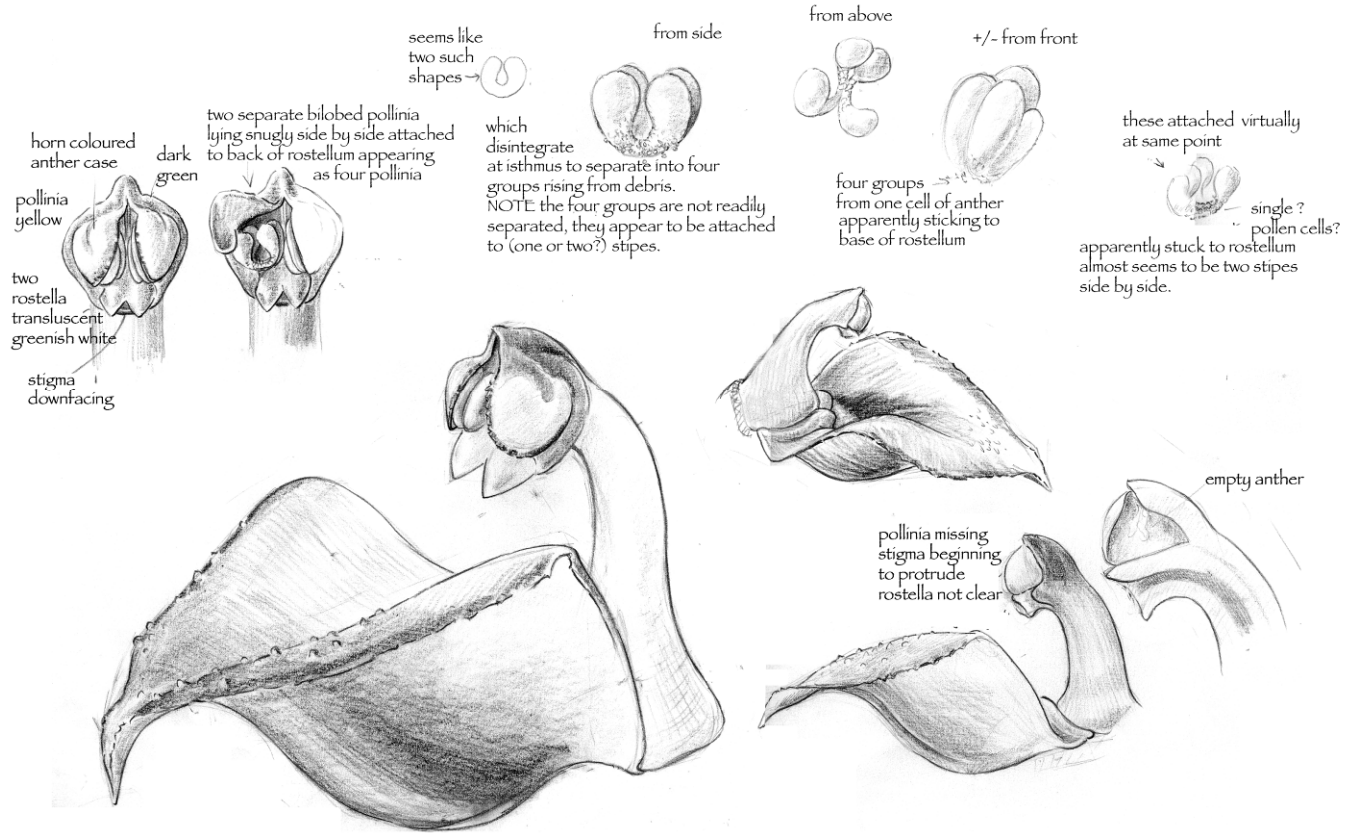
(ii) Pollinia of two species of *Bulbophyllum* have to dry and shrink over about 2 hours before they can be inserted into the stigmatic cavity.

(iii) A third mechanism involves the retention of the anther cap – anther tissue that covers the pollinarium while it is still in place on the column. In most species, the anther cap immediately drops off the pollinarium following its removal by a pollinator, but in a few species the anther cap clasps the pollinia, making them unavailable for a period, before the anther cap drops off. This delay may work to reduce the chance of insect-assisted selfing.

A number of researchers have measured anther cap retention times: eg, about 20 min in a number of species of *Catasetum*; 2–3 h in *Cycnoches lehmanni*; up to 40 min in

Acianthus sinclairii

Katikati (Sapphire springs) collected 23 Jun 1988

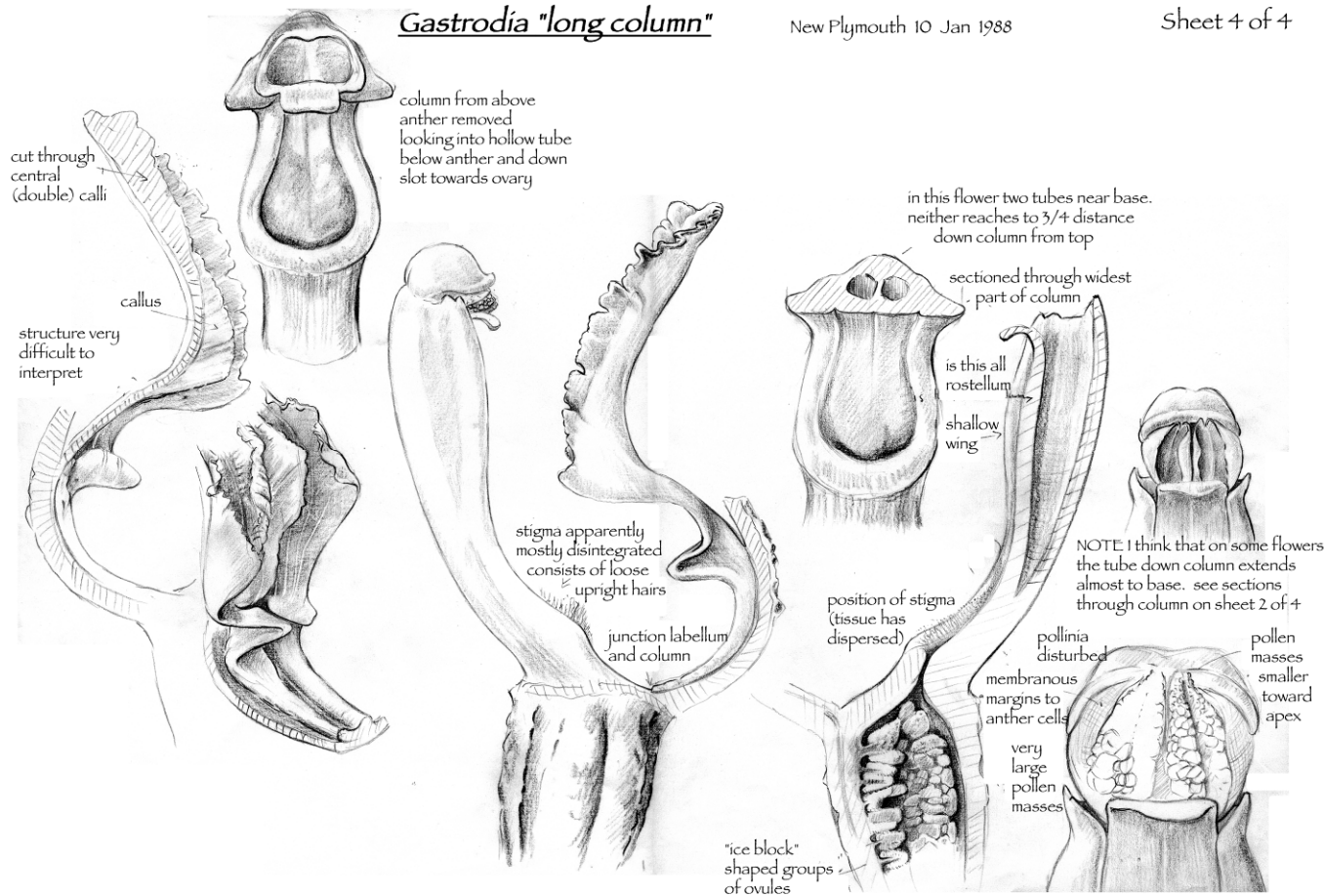


From Tyler B, St George IM (eds). Bruce Irwin's drawings of New Zealand orchids. NZNOG, Wellington, 2007.

Gastrodia "long column"

New Plymouth 10 Jan 1988

Sheet 4 of 4



From Tyler B, St George IM (eds). Bruce Irwin's drawings of New Zealand orchids. NZNOG, Wellington, 2007.

Pleurothallis luteola; up to 30 min in *Pleurothallis teres* and *P. ochreatea*. These last 3 are small South American orchids pollinated by small flies which spend a lot of time visiting individual flowers. Anther cap retention is a mechanism to limit assisted selfing by insects that spend considerable time visiting an individual plant.

Catling and Catling [2] recorded anther cap retention times of between 8 and 110 min in *Tipularia discolor*, and noted that the two flaps of the anther cap that envelope the pollinia gradually open until the anther cap no longer grasps the pollinia and so falls off. The anther cap in *T. discolor* is small enough to fit into the stigmatic cavity. However, the differing microrelief of the pollinia compared with that of the anther cap effectively limits deposition in comparison with those pollinaria without anther caps.

Peter and Johnson observed that the eastern South African orchid *Eulophia foliosa* is pollinated almost exclusively by click-beetles, which remained on the flowers for on average 301 seconds. The anther cap was retained for an average of 512 sec after pollinarium removal by beetles. In this orchid the anther cap is bigger than the stigmatic cavity, thus preventing the deposition of pollinia until after the anther cap has dropped.

Thus retention of the anther cap for a duration longer than the beetle's visit appears effectively to prevent insect-assisted self-pollination in *E. foliosa*.

What about *Gastrodia* "long column" this summer? I suspect insects (attracted to that freesia fragrance) spend a good deal of time at the plants, that the pollinia are removed with the anther caps intact (a membrane extends partly over the pollinia from the midline of the column—see Bruce Irwin's drawing on page 6), that the combined size of the insect and cap/pollinia bundle is too big to enter the tubular flowers (past a large rostellar shelf) and reach the stigma deep in the base, so the disappointed insect flies around until the cap comes off, by which time it is close to a different plant, and can effect cross-pollination.

Fall-back self pollination should be achievable by the flowers turning upward after a time, the pollinia loosening from the anther cap and falling onto the stigma. In populations I have seen fruit is very rarely set, bare stems being the norm, so these devices seem rather ineffective.

On the other hand Eric Scanlen tells me in Invercargill it drops its seed capsules when the weather is too warm, whereas plants in deep shade set ample seed.

3 More on pollination by fungus gnats:

Goldblatt *et al* from St Louis [3], and Okuyama *et al* from Kyoto [4] studied saxifrages. A fungus gnat is the primary pollinator of *Tolmiea* species; pollen is transferred to ventral portions of the gnat's thorax while it probes for an unusually dilute nectar produced at the base of the floral tube. When it forages for nectar on a female phase flower, grains are transferred to the two receptive stigmas on each pistil. Fungus gnats were the principal pollinators of four *Mitella* species; they landed on the flowers, and pollen grains were attached to their bodies.

Ackerman and Mesler [5] looked at *Listera cordata* (the lesser twayblade orchid) in northern California. When an insect contacts the touch-sensitive trigger hairs of the rostellum, the pollinia are suddenly released and become cemented to its body. Visitors are attracted to the flowers by their foul odour and minute quantities of nectar presented on the surface of the labellum. The most abundant pollinators of *L. cordata* were fungus gnats.

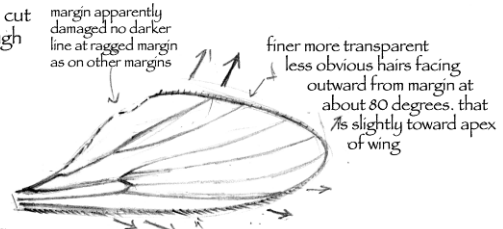
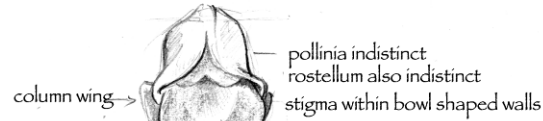
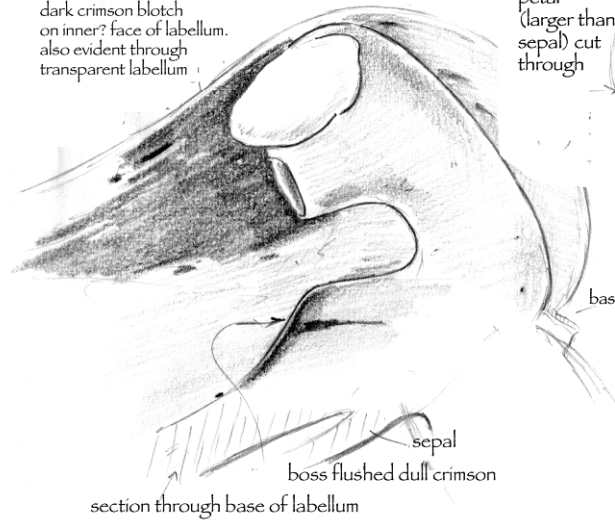
Blanco and Barboza [6] studied the orchid *Lepanthes glicensteinii*. Sexually aroused males of a fungus gnat were the only visitors and pollinators. The initial long-distance attractant seemed to be olfactory. On finding a flower, the fly curled his abdomen under the labellum and grabbed the appendix with his genitalic claspers, then dismounted the flower and turned around to face away from it. The pollinarium became attached to his abdomen during this pivoting manoeuvre. Pollinia were deposited on the stigma during a subsequent flower visit. The flies appeared to ejaculate during pseudocopulation.

Molloybas cryptanthus

Corybas cryptanthus
 drawn ex Omoana 7 Aug 1995
 flower had been severed by insect
 perhaps a week earlier

flower overmature and probably pollinated by
 a (fungus gnat?!) the remains of which were
 attached to top of column

dark crimson blotch
 on inner? face of labellum.
 also evident through
 transparent labellum



wing of tiny fly
 found with the
 second wing and
 a decomposed
 body in front of
 stigma. drawn at same
 scale as column drawings

very fine dark hairs lying at
 30 degree angle to wing margin
 (facing forward and outward)
 possibly there is a line of very small
 pale hairs along veins- particularly
 those near leading edge

Thus the ubiquitous fungus gnat seeks to gratify his sweet tooth as well as his sexual appetite from different orchids.

4 *Molloybas cryptanthus* is said to be predominantly self pollinating, and intuitively that would appear so—the flower is rarely seen above the leaf litter, and should be inaccessible to insects.

But that does not take into account the life cycle of the fungus gnat. The adult fungus gnat lays its eggs singly or in clusters, in rotting leaf litter. In about 4 days, the eggs hatch into tiny, silvery white larvae. Within 2 weeks the larvae begin to spin tiny cocoons in the litter. The pupal stage lasts a week. Adult fungus gnats emerge and mate. The adult stage lasts only another week, but the female will lay around 100-150 eggs during that time. The entire life cycle lasts about 4 weeks.

When the adults hatch they are ready to mate, a traditional season for orchids to seduce the males into pseudocopulation.

Have a look at Bruce Irwin's drawing of *Molloybas cryptanthus* on page 8. The flower had been pollinated and he found the decomposing body of what appears to have been an adult fungus gnat stuck to the stigma.

Furthermore the stigma appears to be well-protected from self pollination by being deeply recessed and facing down and forward.

OK, now think about how you might prove insect pollination in a buried orchid flower....

You can't say with any certainty that the insect was the pollinator, but what you can say is insect pollination by fungus gnats is *possible* (adult gnats hatch from cocoons in the leaf litter, and an adult gnat has been found stuck to a stigma), and that self pollination would be difficult (the structural relationship between anther and stigma creates a significant barrier).

5 **Some terms** used by those who write about pollination may need explanation (after van der Pijl & Dodson [7]).

- The **anther** is a cap-like structure at the apex of the column: it contains the pollinia.
- The **pollinia** consist of bundles of pollen

grains more or less bound together by viscin threads; a small amount of pollen with viscin strands is elongated to form a **caudicle** which attaches the pollinia to each other or to a viscidium (see below).

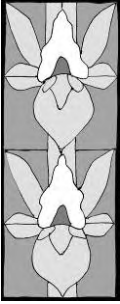
- The **stigma** is a shallow depression composed of the three stigmatic lobes of monocotyledons. It produces a sticky sweet nutrient solution for the pollen grains.
- In most orchids part of the third stigmatic lobe is sterile and specialised and forms the **rostellum**. In many orchids the rostellum forms a flap between the anther and the stigma proper. There it may form a barrier to self pollination, may deposit sticky liquid on a visitor, which then brushes the pollen which sticks to its body, or may be further specialised so the caudicles of the pollinia are already attached to the rostellum and a part of it comes off as a sticky pad called a **viscidium**.
- In some orchids a strap of nonsticky tissue (the **stipe**) connects the pollinia, via the caudicles, to the viscidium.
- The complex of pollinia, caudicles, stipe and viscidium is called the **pollinarium**.

Acknowledgements

Bruce Irwin's drawings are a true treasure trove of information and inspiration, and the publication of his book is certain to be seen as one of the defining events of New Zealand orchidology.

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EPONYMOUS ORCHIDS: VAL SMITH

William Lewis Townson (1855-1926)

Townsonia deflexa Cheeseman. Man. New Zealand Fl. 692 (1906).

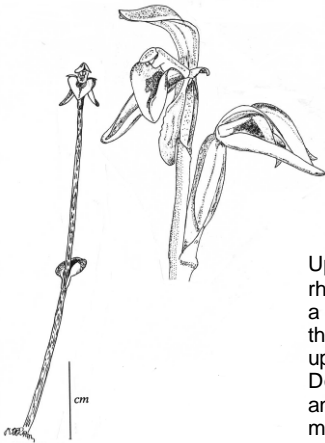
Born in Liverpool in 1855, William Lewis Townson was the son of Mary and Benjamin Townson, a surgeon and physician. He was educated with a medical qualification in view, but chose instead to become a pharmaceutical chemist. He came to New Zealand as a young man, and in 1888 set up in business as a chemist and druggist in Westport. The following year, when he was 34, he married Lucinda Dagg at Masterton.

During his Westport years he collected plant specimens, at first for Thomas Kirk and later for Cheeseman, from the extensive southwest Nelson district, much of it not previously botanised. Many of his finds were described in Cheeseman's *Manual of the New Zealand Flora*, and several, including the new orchid genus *Townsonia*, were named in his honour. Around 1906 Townson moved to the North Island, carrying on his pharmacy work in

several centres before buying the Thames business of the late J W Hall (*Podocarpus hallii*) in 1918. He continued to send Cheeseman specimens and observations from widely spread districts; however, the North Island had already been well combed by other collectors. Townson's most important work was in the South Island, and his one published paper was on the vegetation of the Westport District and a list of plants.

Townson wrote about his Westport travels, "I have never regretted consenting to prepare this list, although I had no conception that it would prove to be such a big undertaking, for thousands of miles had to be walked, over hill country and plain, in fair weather and foul, and numerous difficulties had to be surmounted. But in looking back upon these years of wandering, when all my senses were on the alert, and my thews and sinews were strong to stand the strain of the longest day's tramp, when the book of nature was no more a sealed book for me, and the trees, plants and birds became my familiar friends, they were, undoubtedly, the happiest years of my life."

Townson was of a modest and gentle nature, but full of energy and enthusiasm. A man of many interests, he was a student of Māori customs and traditions, and a lover of music, good literature and gardening. He related well to others, and shared his time and knowledge generously. When William Lewis Townson died at Thames in 1926, at the age of 71, tributes at his funeral included, appropriately, floral contributions from pupils of the local High School, to whose Rambling club he had been guide, counsellor and friend.



Up to 100mm tall. Unlike *Acianthus* it has a creeping rhizome which also bears tubers. Leaves of two types; a petiolate round leaf with undulating edge rising from the rhizome and an elliptic, sessile bract about half way up the stem. 2-4 horizontal, greenish 5mm flowers. Dorsal sepal and labellum broad, lateral sepals longer and keeled, petals very short and upright. In deep mossy montane beech forest. It flowers in December.



6. *Ichthyostomum pygmaeum*

at Days Bay 16 July 07, the ostensibly bivalved capsule, as big as the pseudobulb, still containing some of the pollen granules that are otherwise scattered over the vegetation below it.



7. The wasp, *Neozeleboria cryptoides* pollinates *Chiloglottis trapeziformis* by pseudocopulation in Australia; photograph by Rod Peakall.



8



9

The tulip orchid

Kevin Matthews took these photographs of *Anzybas rotundifolius* near Kaitaia in July: the plant his forebear HB Matthews called "the tulip orchid". See p.19.



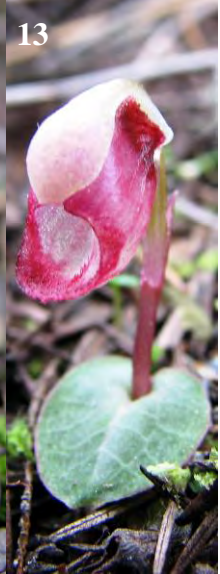
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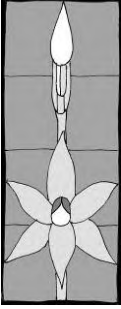
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12



13



VARIOUS CONTRIVANCES

The New Zealand terrestrial orchid flora is unique because most can self pollinate: the various contrivances by which the New Zealand orchids

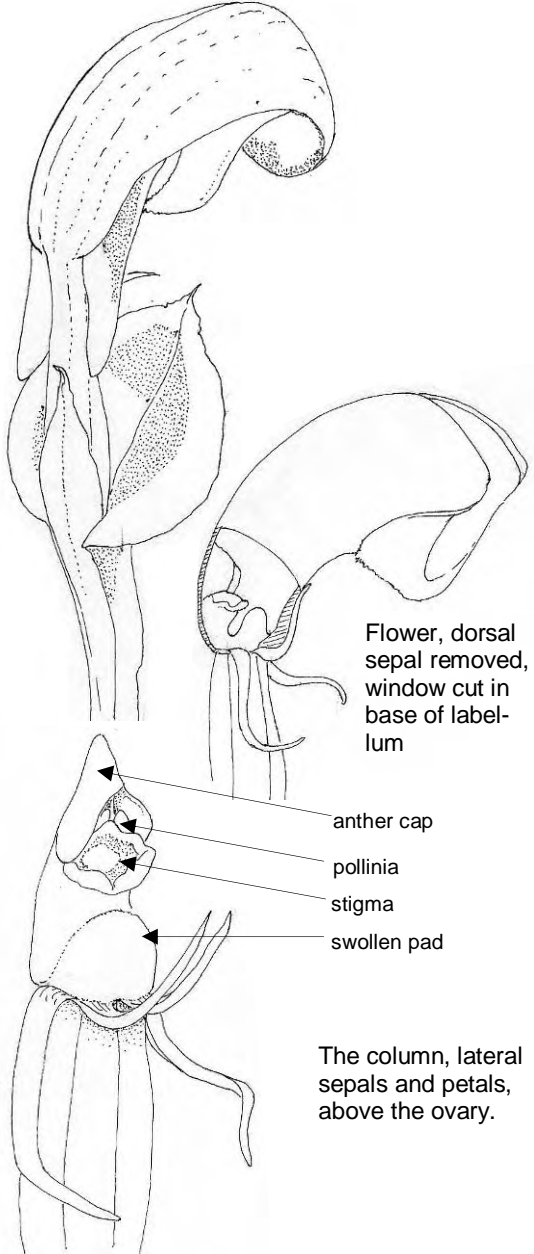
Corybas cheesemanii

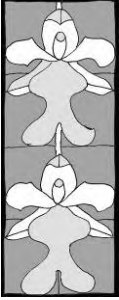
Our only *Corybas* is *Corybas cheesemanii*, a tiny forest floor dweller, its flower and leaf often almost buried in the leaf litter, not exactly flaunting itself to insects. The characteristics of its genus are the large, enclosing dorsal sepal, the much reduced lateral sepals and petals, the strongly folded labellum with a pair of deflexed closed spurs at the base, the squat column with its anterior base expanded into a swollen fleshy pad. It has been said that that pad is a nectary, but I have seen no proof of that, and whereas orchid spurs usually contain nectar, these contain no liquid.

Which is as one would expect, since the flower is self pollinating.

The upward facing cupped stigma is perfectly placed to catch falling pollen, and there is little in the way of an intervening rostellar/stigmatic shelf to bar the way.

Almost every flower of *Corybas cheesemanii* sets fruit, the thick elongated fruiting stems seeming disproportionately large compared with the tiny plants.





ELEMENTARY: ED HATCH

14. Miscellaneous terrestrials 3.

Drawings by Ian St George

Chiloglottis

(the tongue-shaped labellum)

Peduncle elongating after fertilisation of *Corybas* and *Nematoceras*

8: *Chiloglottis cornuta*

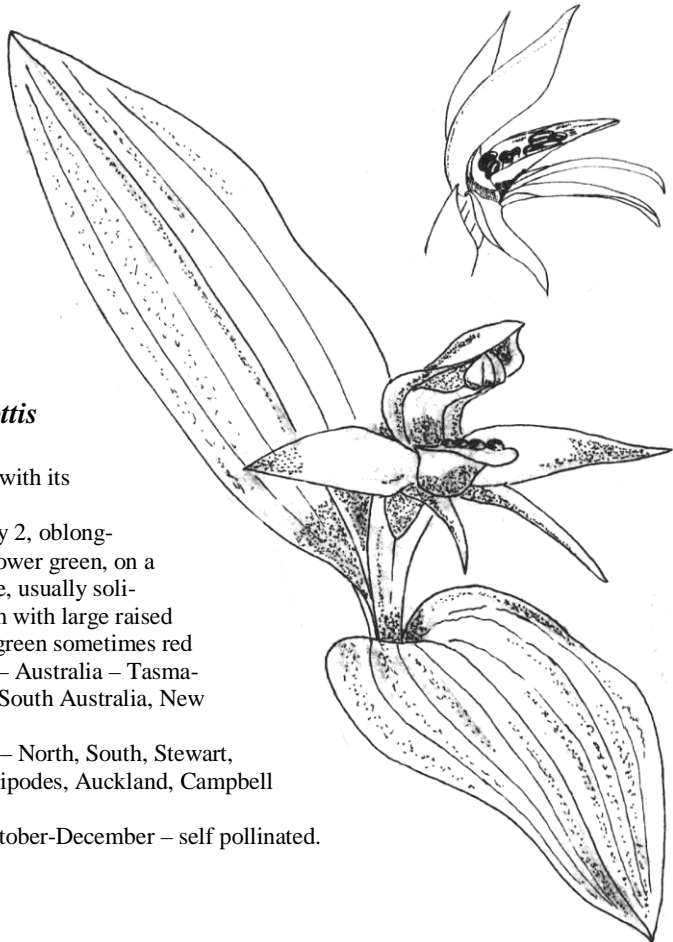
(the labellum with its
distinct calli)

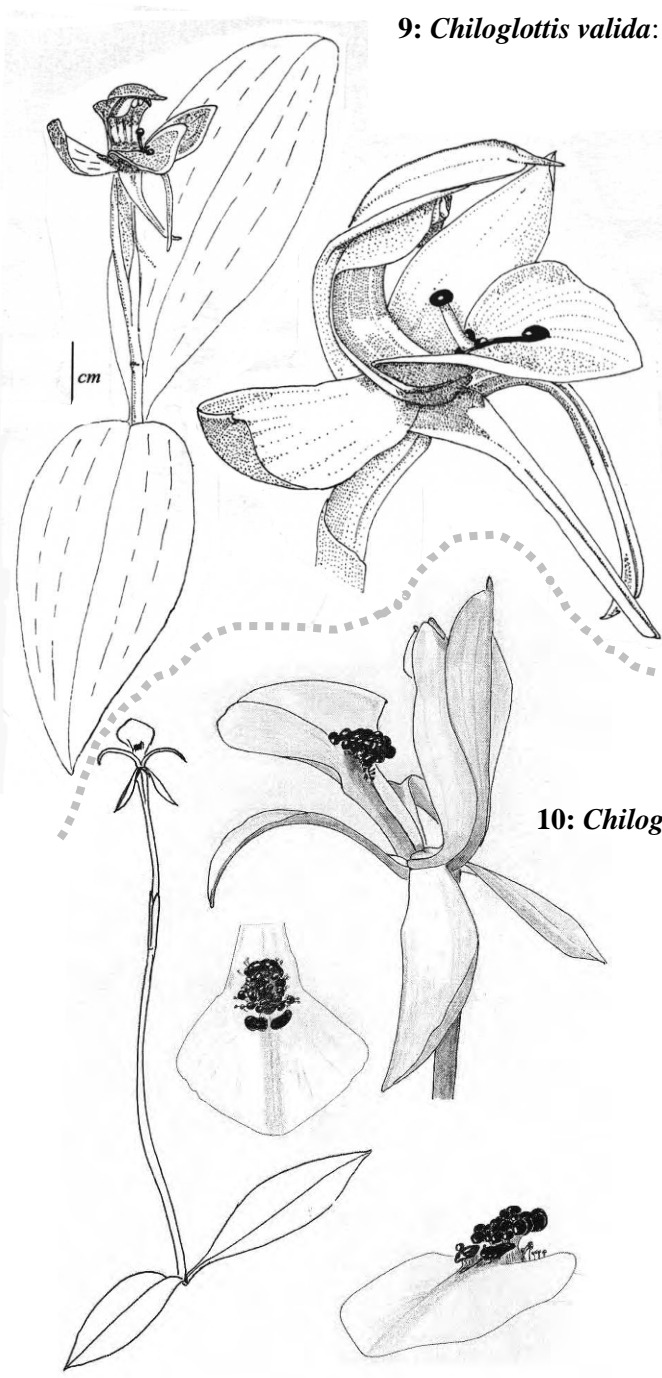
Leaves usually 2, oblong-
lanceolate. Flower green, on a
short peduncle, usually soli-
tary. Labellum with large raised
calli, usually green sometimes red

Distribution – Australia – Tasma-
nia, Victoria, South Australia, New
South Wales;

New Zealand – North, South, Stewart,
Chatham, Antipodes, Auckland, Campbell
Is.

Flowers – October-December – self pollinated.



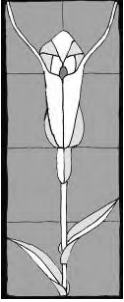


9: *Chiloglottis valida*:

(robust or strong-growing)
 Generally similar to *C. cornuta*, with which it often grows, but the plant is larger and the flower tinged with reddish-brown. Labellum with a stalked callus at the base and a sessile callus on the disc, with pairs of gloss black, ant-like calli on either side
Distribution – Australia – Tasmania, Victoria, New South Wales; New Zealand – North Id., Iwitahi, under *Pinus nigra*; South Id., Marlborough, Richmond Range; Canterbury, Hammer Forest Park, under *Larix decidua*; Te Anau
Flowers – October-December – These 4 occurrences would appear to be separate transtasman arrivals. Although the plants flowers freely they don't set viable seed, and spread by vegetative increase only – insect pollinated but no suitable local insects?

10: *Chiloglottis trapeziformis*

(the kite-shaped labellum)
 Unlike *C. cornuta* the flower is borne on a peduncle \pm 80mm high, which continues to elongate after fertilisation
Distribution – Australia – Tasmania, South Australia, New South Wales; New Zealand – North Id., Kaitaia 1900-1915; Hoki Beach, Levin, 2001 *et subseq.*
Flowers – September-November – In Australia the flowers are pollinated by male Thynnid wasps *Neozeleboria cryptoides* (see pp.12 and 23 —Ed). This wasp is absent from NZ, and the plants behave as normal vagrants.



AUSTRALIAN NOTES: DAVID MCCONACHIE

Threatened orchids of southwestern Victoria

Andrew Pritchard, DSE
Threatened Species Project Officer
From *ANOS (Vic) Bulletin 40 (1)*,
July 2007

Andrew and a small but enthusiastic team of scientists, together with Colin Bower, an entomologist from New South Wales, conducted the following research during 2006.

Many Australian terrestrial orchids mimic female thynnine wasps and are pollinated by males trying to mate with the flower. Sexually deceptive orchid flowers are characteristically dull coloured, often inconspicuous, pollinated by males of a single specific wasp species, emit a mimic of the female sex pheromone to attract males from a distance, have labellum structures that mimic the shape and colour of the female wasp, and lack nectar and sweet odours. Female thynnine wasps are wingless and spend most of their lives burrowing in soil and seeking beetle larvae to parasitise. They emerge every few days and advertise for males by emitting pheromones. The male wasps respond rapidly, pick up the smaller females and fly them, in copula, to nectar sources where the females feed.

Because many terrestrial orchid species are pollinator specific, if the pollinator becomes locally extinct due to habitat modification and loss of critical resources, that population will become vulnerable or locally extinct. If the pollinator becomes extinct over the whole

range of the orchid, that orchid species will become totally extinct unless it has the ability to reproduce vegetatively and/or self pollinate.

The best reproduction in sexually deceptive orchids results where high orchid and pollinator populations occur together, so sexually deceptive orchids with common pollinators are usually common while orchids with rare pollinators are likely to be rare.

Knowledge of the identity of pollinators, and their distribution and abundance, may be important for developing successful recovery strategies for threatened orchid species. Recovery plans should include objectives to determine how much natural pollination is occurring; identify the pollinators; determine the distribution, abundance and habitats of pollinators; use those data to determine if habitat enhancement for pollinator populations is feasible at orchid sites or, alternatively, locate suitable sites with good pollinator populations for establishment of new self-sustaining orchid populations. In the long term, it is not a good strategy to hand pollinate to maintain orchid populations.

The project aims to collect and identify the pollinators of as many threatened and other *Caladenia* spp. as possible in southwest Victoria; to determine the distribution and abundance of the pollinators; and to locate potential establishment sites with large pollinator populations for rare *Caladenia* spp.

Sexually deceptive orchids are highly attractive to their pollinators, yet it is rare to see insects on flowers in the field. The reason is that male wasps learn to avoid the locations of non-rewarding stimuli. The secret to collecting pollinators is to provide the wasps with stimuli (flowers) at new locations, which they interpret as a potential new female. Males respond within seconds to new calling females, and most nearby males will arrive at a new flower location within a few minutes.

However, once males have learnt the stimulus at a particular location is false, they generally do not respond again. This

behaviour can be exploited in the technique known as 'baiting'.

Thirteen species of orchids were tested. No thynnine wasps were attracted to *C. versicolor* after 163 three minute exposures at four sites. The pink-mauve labellum markings of *C. versicolor* are not consistent with mimicry of female thynnine wasps, but are more like flowers pollinated by native bees. *C. versicolor* is also sweet-scented; another characteristic of bee-pollinated flowers. *C. versicolor* is most likely pollinated by native bees that also visit other purple-flowered herbs such as chocolate lilies. Bee pollination is not well documented among spider orchids, and *C. versicolor* may be unique in this regard.

Lophocheilus villosus, the pollinator of *C. hastata*, is rare. This pollinator was not located at Point Danger, which was consistent with the lack of *C. hastata* pollination at this site. However, the pollinator was found at Mt. Richmond NP on the last day of the survey, and there was no time available to test whether the Casterton population attracts the same wasp. Further work is needed at both sites. Future work needs to be done on other species in New South Wales, Victoria and South Australia; there is a need to verify bee-pollination in *C. versicolor*; and there is a need to search for more populations of *C. hastata* at Point Danger and to determine the pollinator of the Casterton population. The team want to conduct specific choice tests to determine if there are three cryptic pollinator species in *Phymatothygnus pygidialis*; determine how many members of the *C. reticulata* complex share the *P. var. nitidus* pollinator; and determine the pollinator of *C. grampiana*.

Kate Vlcek of DSE South West (Warrnambool) is working on the translocation of *C. hastata*. 63 *C. hastata* (Melbourne's Spider Orchid) seedlings were transplanted in August 2006. Plants were four year old seedlings, the results of direct seeding trials at Point Danger. Seven previous translocations / reintroductions have taken place since 1982 with an 87% success rate. The purpose of these translocations is to

perfect techniques for the future; to increase the number of sites and "spread the risk"; also to improve vigour of remaining plants at the host site where they are growing in cramped conditions.

On "The Big Day", the team was briefed and they scrubbed down before splitting into groups. Plants were removed from crowded sites and data were recorded. The new site was prepared prior to planting; seedlings were planted at 0.5 metre intervals along a 50 metre transect and then caged. Although the original plan was to plant out up to 105 plants into two transects over the day, things don't always go according to plan. For example, the most vigorous tubers may not be the easiest (and quickest) to remove.

Ongoing monitoring, watering and follow-up care is necessary. The team will also research to determine pollinator identification and occurrence for potential reintroduction / translocation sites.

A total of 63 plants was moved to two new sites within the reserve, the translocation involving the assistance and expertise of many people.

With the future development of sites such as Point Danger resulting in habitat loss and degradation, having the knowledge and experience to undertake translocations and reintroductions is unfortunately becoming increasingly relevant.

Andrew thanked A.N.O.S. Vic. members for their assistance over many years with orchid recovery. Last year, recovery efforts after the Grampians fire were instrumental in assisting the protection of *Caladenia versicolor*. The work consisted of removing soil disturbed by the fire, and the installation of guards around emerging leaves allowed the plants to flower freely.

Searching by the A.N.O.S. Conservation Group during spring uncovered a large number of new populations of orchids within the Grampians fire area, and further work this year will be conducted on the *Pterostylis chlorogramma* and *Paracaleana disjuncta* populations that were discovered last year.

CLOSE RELATIONS: ORCHIDS LIKE OURS

Cryptostylis longifolia painted by Ferdinand Bauer, engraved by A Gebhardt, published in S Endlicher's *Iconographia Generum Plantarum* (1838).

Orobanchaceae.

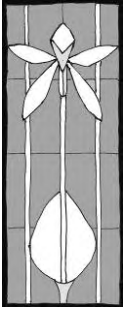
Neottiae (1879)



Ferd. Bauer del.

Cryptostylis longifolia R.Br.

Schubert (17)



NOTES ETC

Jeremy Rolfe has a small colony of *Corybas cheesemanii*, in the bush above his Stokes Valley property (Figs 1-3, inside front cover), with elongated dorsal sepals, and even an albino bud.

The July issue of *The Kalhari*, the ANOS Kabi (Queensland) group's "message stick", contained photographs by Graham Corbin, its editor, of *Acianthus fornicatus* and *Corybas barbarae* (white form). They are reproduced (inside front cover) with permission as Figs.4 & 5. And aren't they remarkably similar to *A. sinclairii* and *C. cheesemanii*? - Ed.

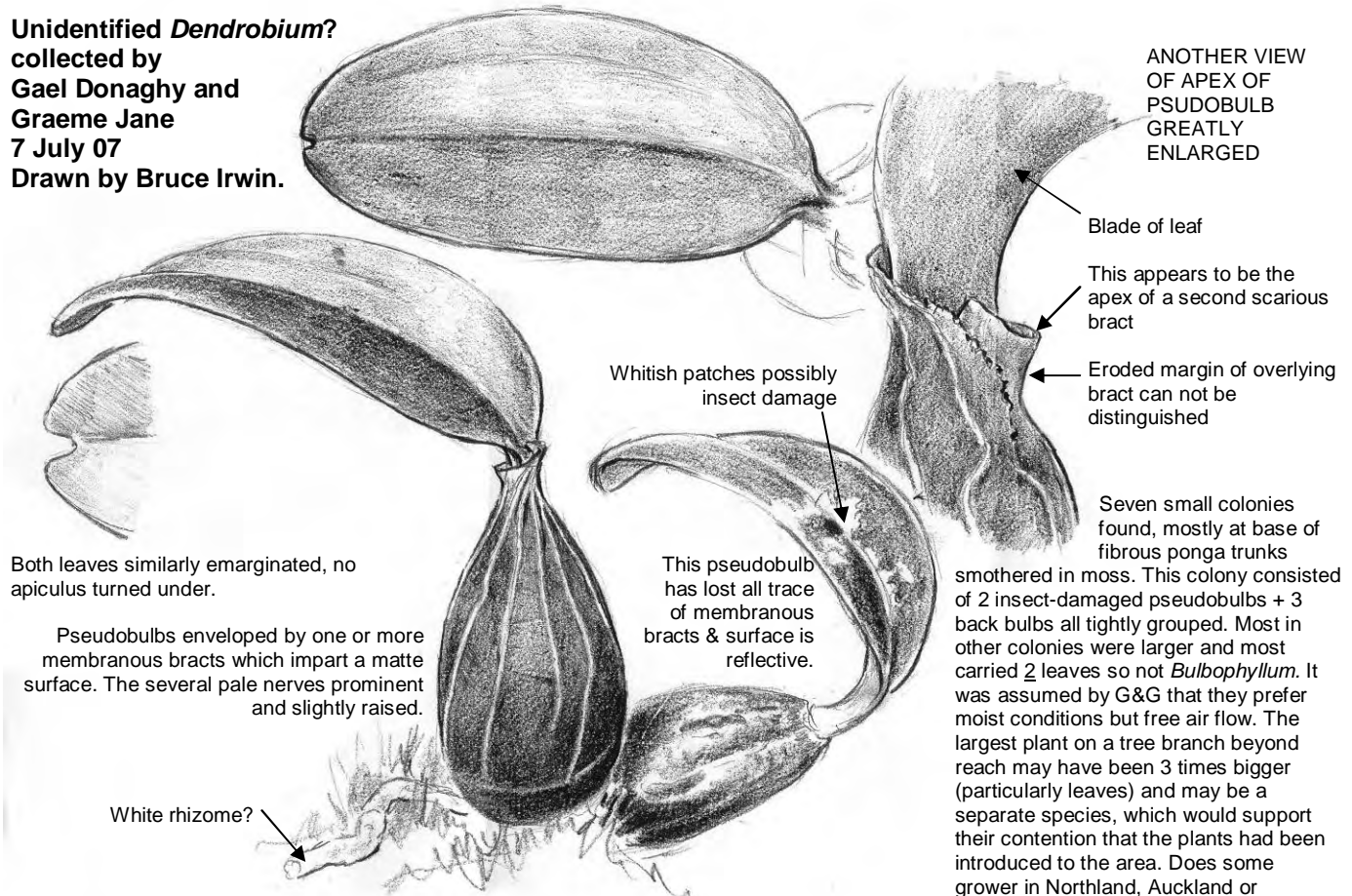
Associate Professor Rod Peakall at the School of Botany and Zoology, Australian National University in Canberra has a stunning set of photographs of insects pollinating native orchids (see http://www.anu.edu.au/BoZo/orchid_pollination/). He has given his permission for us to reprint Fig.7, of the male wasp pollinator *Neozeleboria cryptoides* on the labellum of the orchid *Chiloglottis trapeziformis*. The wasp is carrying pollinia removed during pseudocopulation with a previous flower. The callus structures on the labellum mimic the flightless female of the wasp pollinator. Dr Peakall's work was recognised recently in a feature in the prestigious *Nature* (22 Feb 07): "The flower of seduction: Heidi Ledford looks at how dishonesty gives orchids the evolutionary edge".

So you didn't think there were any **Arabian wild orchids**? Neither did I. Look at <http://www.saudiaramcoworld.com/issue/200606/orchid.arabia.htm> where Eric Hansen (author of *The orchid thief*) writes about them.

On 25 July 07 Kevin Matthews sent the mirror-image shot of back-to-back *Anzybas rotundifolius* from the back of his farm (Fig.8). He wrote, "*Anzybas rotundifolius* flowers are very slow to open fully. Some have differing intensities of the red factor. They start off as a port red (Fig.9) and it would appear the colour dilutes from some of the labellum as the flower progresses. See Fig.12 taken on 17 June of a close neighbour to that shown in Fig.9 and only a few days ahead in flowering time (that was 39 days ago). It gives you some indication of the time these flowers continue to last and slowly develop before I guess they are ready to be pollinated. This would to some degree explain why they are sparse – a lot of bug and bird muncher exposure time! I also noticed that a large proportion of *Anzybas* leaf are not going to produce flower; I guess they are building energy for next season – it must be quite draining on the plant sustaining a flower over that long time frame. Some have a very acute apex to the labellum (Fig.10), also varying lengths to the dorsal sepal – some rounded, some pointed and recurved into the labellum."

Gael Donaghy emailed (9 July 07), "Found this (Fig.14, 15) in the weekend up the Coromandel. One plant on an *Olearia rani* and about 7 plants underneath on a puna root. We have walked the track many times and never seen it, although it's probably 3 years since we have been there. We took it to show Bruce last night, and he doesn't recognise it as any cultivated one he has seen. I thought it might be a be a wilding *Dendrobium kingianum*, but comparing it to similar size plants from our garden, the Coromandel plant has leaves which are more rounded and a different green, and pseudobulbs which are shorter, more swollen

Unidentified *Dendrobium*?
 collected by
Gael Donaghy and
Graeme Jane
7 July 07
 Drawn by Bruce Irwin.



ANOTHER VIEW
 OF APEX OF
 PSUDOBULB
 GREATLY
 ENLARGED

Blade of leaf

This appears to be the
 apex of a second scarious
 bract

Eroded margin of overlying
 bract can not be
 distinguished

Whitish patches possibly
 insect damage

This pseudobulb
 has lost all trace
 of membranous
 bracts & surface is
 reflective.

Seven small colonies
 found, mostly at base of
 fibrous ponga trunks
 smothered in moss. This colony consisted
 of 2 insect-damaged pseudobulbs + 3
 back bulbs all tightly grouped. Most in
 other colonies were larger and most
 carried 2 leaves so not *Bulbophyllum*. It
 was assumed by G&G that they prefer
 moist conditions but free air flow. The
 largest plant on a tree branch beyond
 reach may have been 3 times bigger
 (particularly leaves) and may be a
 separate species, which would support
 their contention that the plants had been
 introduced to the area. Does some
 grower in Northland, Auckland or
 Coromandel have a collection of small
 epiphytes?

Both leaves similarly emarginated, no
 apiculus turned under.

Pseudobulbs enveloped by one or more
 membranous bracts which impart a matte
 surface. The several pale nerves prominent
 and slightly raised.

White rhizome?

These bulbs appear to consist of a single node (possibly a squat second node at base).
 Older plants in better conditions may consist of several internodes.



14, 15. The strange *Dendrobium* (?) from the Coromandel ranges (see p.20); photographs by Gael Donaghy.



16, 17. *Nematoceras* "pygmy" near Kaitaia, photograph by Kevin Matthews.

18. Copper-topped *Diplodinium trullifolium*: photograph by Kevin Matthews.



and grooved. The longest leaf was 2.5cm. Bruce compared it to *Bulbophyllum tuberculatum*, but it has two leaves per pseudobulb and no tubercles.”

Bruce Irwin wrote shortly afterwards, “Gael and Graeme brought round a small clump of a **strange orchid**. It was clearly fighting for life: a well grown plant may appear quite different. At first glance it looked very like *Adelopetalum tuberculatum*, in other words a *Bulbophyllum*, but most plants carried two leaves. I enclose photocopy (p.20) of my laboured sketches. The plants were badly chewed by insects and the bracts sheathing the pseudobulbs eroding away. The notes scribbled on the print may help identify the plant.”

Kevin Matthews emailed (30 June), “I had a very successful day in the Ahipara area ... before the weather closed in. This early flowering *Nematoceras* ‘pygmy’ (Fig.16, p22) was very abundant in a given area, along with rampant *Diploidium alobula* and *Acianthus* galore. Eric tells me the nearest known site for this form of *Nematoceras* is Bream Trail 180km away. I had the chance to inspect many flowers which showed some variance in the ragged labellum and colour, some flowers sat on the leaf, some below and some above. Some were still in early bud while other leaf showed no sign of flowering. The dorsal sepal tip is generally rounded while a few were sporting a slight cleft. Can you comment on the fine hairs within the labellum walls and below the labellum cleft? I have not read any reference to this for *Nematoceras*.... The fine hair is not easy to capture, but you can see it below the labellum cleft and a shining line of white hairs on the left (Fig.17). The hairs are more or less dispersed over the inner walls of the labellum.” Kevin also sent photographs and specimens of a spot at the back of his farm where there is a large population of *D. trullifolium*, “but I had never noticed the 2 colonies of this copper variation. The flowers tend to be smaller than the green form and the lateral sepal filaments are less erect (Fig.18)”.

Molloybas cryptanthus has been found sporadically over the last dozen or so years along a ridge near Wellington, under beech, but with kanuka always present too. It was in bud on 17 July 07, and when I returned on 15 August it was in full flower. Immature plants appear as short white threads—Ed.

www.publish.csiro.au/80/nid/18/pid/5365.htm is an interesting website. It’s *Australian orchid genera: an information and identification system*, which presents the current status of orchid taxonomy in the form of an illustrated interactive key. All 192 genera of Australian orchids are included, capturing the results of recent revisions affecting Australian Orchidaceae. “This powerful tool ensures an easy-to-use means of identifying an orchid to generic level using whatever information is available to you. The 127 characters cover morphology – floral parts, fruit, leaves, stems and pseudobulbs – and geographic information. Interpretation of characters is assisted with help notes and images. Identification is assisted using a page of annotated images illustrating unique flower structures.”

www.anbg.gov.au/cpbr/cd-keys/orchidkey/html/bibliography.html has an excellent list of **publications relating to the taxonomy of Australian orchids**.

In a paper published in June 2006, Hopper and Brown **upheld the generic rank of *Paracaleana*** on the basis of its divergent pollination syndrome (sexual deception of male thynnid wasps compared with pollination of *Caleana* by male sawflies), recent DNA sequence data demonstrating monophyly, and nomenclatural stability. They recognised 13 species in Australia, ten of them new. [Hopper SD, Brown AP. Australia’s wasp-pollinated flying duck orchids revised (Paracaleana: Orchidaceae). *Australian Systematic Botany* 2006; 19(3): 211–244]. *Hmmm—no thynnid wasps in New Zealand, so our Rotorua *Paracaleana minor* must be a selfer—Ed.*

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NZNOG AGM: TARANAKI 10-11 NOVEMBER 2007

(AGM agenda and reports will be sent with the November Journal—Ed)

Field trips to Pukeiti Rhododendron Trust and North Egmont.

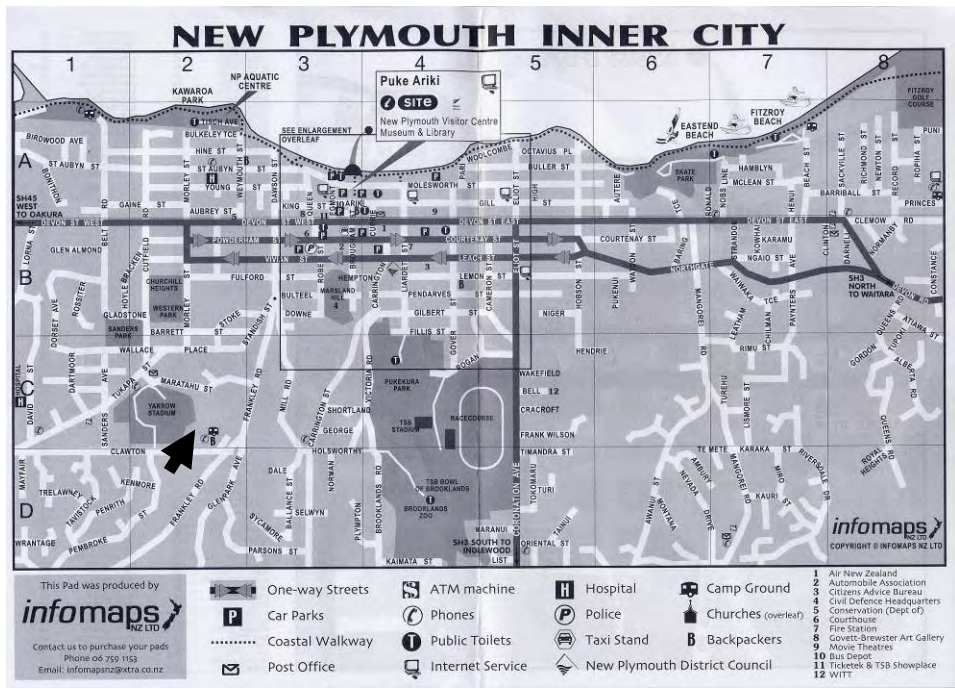
AGM venue and accommodation are arranged for the nights of 9 & 10 November at Egmont Eco Leisure Park 12 Clawton Street New Plymouth (arrowed in map below). Accommodation is bunk room style:

\$28 per night with your own bedding, or \$31 per night with bedding provided.

Entry to Pukeiti Rhododendron Trust (\$9) will be the individual's responsibility. Pot luck dinner Saturday night, kitchen facilities available. Members wanting to arrive earlier and /or depart later can make their own booking for the extra time by contacting Egmont Eco Leisure Park, phone 06 7535720 or fax 06 7535782 stating attending NZNOG conference.

Local visits can be arranged for early arrivals on Friday by phoning Ernie Corbett ph 06 7537563.

Full payment is required by 29 September 2007 to confirm accommodation: send to Ernie Corbett 5 Anson Place Westown New Plymouth 4310.





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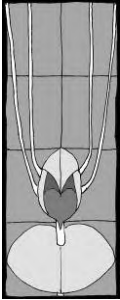
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THE COLUMN: ERIC SCANLÉN

1. *Nematoceras* “tricraig”; Pollok to Glen Murray

The Column was working through the tedious *Nematoceras trilobum* aggregate, when something hit him, figuratively speaking, like a board in the face, causing yet another mental back-flip. Plants tagged *N.* “tricraig”, *N.* “trirex” and *N.* “trilowry” were apparently all the one taxon. The first, from Pollok, 11 Aug 05, of fly’s eggs’ fame in Journal 98:34, the second, 15 Aug 05 from cousin Rex Blumhardt’s forest farm at Klondyke Rd, west of Onewhero and the third, 28 Sep 05 from Lowry’s farm at Glen Murray, 47km south of Pollok. You may not have heard of the last two tags; the orchids were common at both sites and ancillary to our quarry, *N.* “Pollok” [J93:20] which was not found on these unpublicised field trips.

N. “tricraig” had variable colonies all around Craig’s piece of cattle traversed bush and suspicion fell on *N.* “Pollok” some 40m away (where stock cannot reach them on a cliff) as being involved in hybridising; however, the gnat’s eggs in *N.* “tricraig”’s labellum pocket, gave it enough interest for publication. But *N.* “trirex” (Fig. 19) and *N.* “trilowry” (Fig. 21) two of the tedious *N. trilobum* taxa that seem to occur wherever one goes, got photographed only as a palliative to our disappointment for not finding *N.* “Pollok”.

Photos of the orchids in 3-D, when compared, caused the

Column’s board-in-the-face feeling and basically established the August-September flowering *N.* “tricraig”, as they are all now being dubbed, as a taxon worthy of individual attention. Bruce Irwin’s outstanding drawings of *N. trilobum* specimens in Woodland Rd, Katikati from 31 July 1987, appear to be of the self same taxon. Just how widespread is this iconic form of the species?

Distinguishing features of *N.* “tricraig” include ± 6 mm wide flower (Fig.20) below and usually askew to the leaf, on a short ± 3 mm pedicel jutting out of the erect stem at $\pm 60^\circ$. *Peduncle* and *petiole* are variable in length depending on ground cover. *Leaf* is trilobate, kidney shaped sometimes with undulate margins, *floral bract* is acuminate and green, *secondary bract* can be a mere bump or as long as the ovary and parallel with it, the tip being tucked under the labellum bib (Fig.20). The secondary bract is the incipient second flower so will no doubt vary with the vigour of the plant. *Lateral sepals* 20-40mm, erect, from 90° spread to parallel, lateral petals ± 12 mm outstretched \pm level, all tinged with maroon. *Dorsal sepal* is a deep, retuse to emarginate helmet, green but with purple veins showing in maturity. *Labellum* has a cup shaped opening with in-curved ragged maroon margins and an arrow head apiculus in the usual Vee notched bib. Green thickenings form the *egg pocket* in the channel with a small drain hole. The visible inner surface to the margin is adorned with short, white hairs, no doubt giving any pollinator a good foothold. The midrib rises on a back lean, (Fig. 21) turns through $\pm 300^\circ$ at the first flexure then describes an S bend to the apiculus touching the ovary. Typical of the genus, the pale green *column* lies back in its very dark red surround, with colourless *auricle vents* narrowing slightly at the outlet and dropping away either side, tucked out of sight behind the labellum bib.

Preferred habitat is scrubby bush, near spur tops or in hollows. Rex had numbers on a spur-top track in *Pinus radiata* but several

colonies were in hollows in the native bush.

A closely related taxon is the undescribed *N. "tribriva"* [J84:23-26,29], this *N. trilobum* taxon is found all around the Bridal Veil Falls, Te Mata and on Pukapuka Track in the Hunua Range. Its disjunct known range, straddles to the east of the *N. "tricraig"* distribution so there is indubitably a close connection there. But *N. "tribriva"* has a distinctive down sloping dorsal sepal, a double sized egg pocket and a normal short to zero secondary bract protruding at $\pm 60^\circ$ to the pedicel. It would be interesting to see what form the *N. trilobum* agg. take at Mt Pirongia or at Maungatautari. Any starters?

Acknowledgements

Thanks are due to Tricia and Wayne Aspin, Allan Ducker and to Stella Christoffersen for the Glen Murray and Klondyke Rd. field trips and to James Lowry and Rex Blumhardt for welcoming us to their properties for the *N. "Pollok"* hunt.

In memorial, the late Ian and Pixie Craig let us orchid hunt at will over their most orchid-productive piece of bush at Pollok. They will be sadly missed after passing on last year from illness.

2. *Pterostylis* "Blyth"; Littles Flat to Blyth track

Boring *Pterostylis* aff. *montana* aggregate also had a serious revision, after the Column found three *Nematoceras trilobum* taxa were all none other than *N. "tricraig"*. Sure enough, two well separated sites produced similar taxa which had not previously been connected, causing a further mental back-flip. *P. aff. montana* "Little" from Littles Flat in the Kawekas was the spitting image of *P. aff. montana* "Whakapapa". A further delve through the colour slide archives turned up the original of this taxon, 39 year old Kodachromes of *P. aff. montana* "Blyth" herein abbreviated to *P.*

"Blyth", from the Blyth Track, Ruapehu. It was originally squeezed confusingly into the *P. banksii* var. *patens* file at a time when the Column was confident that all NZ orchids must have been discovered by then! How wrong can one be? Then the Editor pointed out yet another example; Bruce Irwin's *Pterostylis* aff. *montana* "late" (**opposite page**) from Ruapehu in 1983, beautifully drawn, on p. 518 of the CD of all his drawings, complete with details of labellum sections, labellum appendage and column. The distinctive curl at the tips of the lateral sepals doesn't feature here, possibly because they were crafted from a specimen pickled for a week but the long, twisted labellum with distinctive finger-like tip, is most certainly there.

This is apparently an uncommon taxon, usually occurring in ones and twos at widely spaced sites all preferring shady, mossy, tracksides in subalpine beech forest. From the Column's archives, Blyth Track, Ruapehu (**Fig.22**) $\pm 1,060\text{m}$ a.s.l. 11 Dec 1968; Little's Flat, (**Fig.23**) Kawekas [J74:21, fig. 22], $1,060\text{m}$ a.s.l. 6 Dec 1999 and from J87:6,7, Hepi Tce., Whakapapa (**Fig.24**) $1,120\text{m}$ a.s.l. 5 Jan 2003. Around the Whakapapa site, there were numerous colonies of *P. aff. montana* and each colony was marginally different from the others. The Column photographed two only that appeared to be more different than the rest. One from Hepi Terrace was *P. "Blyth"* the other from the Whakapapa Walk is depicted in J87:7 Fig. 2. Allan Ducker's stereo footage including some of the other taxa, on video screen that night in the DoC Lodge, caused a protracted circular debate. Still neither Bruce nor the Column recognised the long nosed *P. "Blyth"*. It is illustrated reversed in J87:7 Fig. 3, so the labellum there appears to twist to the left. Beware! All NZ pterostylids with asymmetrical labella, have them twisting to the right. The Aussies have some twisting to the left — nothing to do with our political systems!

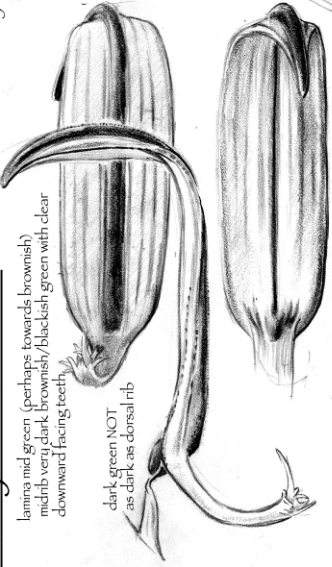
Distinguishing features of *P. "Blyth"*: *leaves* are grass-like, up the stem, like *P. graminea* which doesn't occur in the

Pterostylis aff. *montana* "late"

with very long labellum from Ruapehu Dec 1985

lamina mid green (perhaps towards brownish)
midrib very dark brownish/blackish green with clear
downward facing teeth

dark green NOT
as dark as dorsal rib



pale yellowish
flesh colour

pale flesh
yellow

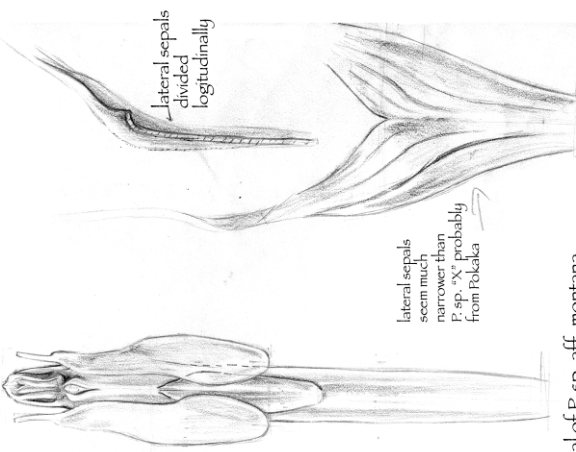
widely spaced veins

from above



NOTE:-
this plant may have been collected just south of
Fokaka which is only 5 or 6kms from where P. "Erua"
was later collected. 6 Dec 1991 see drawing 19 Dec 1985

this plant seems to resemble Pt. "Erua" 6 Dec 1991
but:- (1) lateral sepals are bent (as is usual) at sinus
(2) labellum almost rectangular with very tapered
apex whereas P. "Erua" tapers more gently but
again has very tapered apex
(3) labellum much more strongly arched at 2/3 height



lateral sepals
divided
longitudinally

lateral sepals
seem much
narrower than
P. sp. "X" probably
from Fokaka

seems not typical of P. sp. aff. *montana*
(1) long tapered tip to labellum (2) strongly bent labellum
(3) curved appendage (4) veining of dorsal as in gramineae

this flower pickled-
after 1 week stigma
had shrunk markedly

galea height 2.0cm

tip from
below/side

Pterostylis "Blyth" under the pseudonym of *P. aff. montana* "late". Detailed drawings by Bruce Irwin with typescript by Brian Tyler.

subalpine. *Dorsal sepal* exceeds *lateral petals* by ± 5 mm, *lateral sepals* ± 20 mm, spreading $\pm 90^\circ$ like a small *P. banksii*, straight for the first $\frac{3}{4}$ then the filamentous tips uniquely curl forwards 180° - 360° . *Labellum* is basically green; the end twists to the right $\pm 15^\circ$ like *P. montana* but uniquely, its darkest red midrib ridge, extends finger-like, ± 2 mm at the tip.

Due to the prevalence of *P. aff. montana* around the Central Plateau, field party participants often don't give these flowers due attention and they regard photographing them as a bit of a waste of precious time. That's the Column's excuse anyway for not getting essential details of the inner workings of *P. "Blyth"* at any of the three sites. Fortunately Bruce had taken the trouble to get the details, completing the illustration of this taxon which highlights it from the wide range of *P. aff. montana* taxa and hybrids therein. There is a moral here somewhere; how about; *treat all the boring ones like new species; perhaps they are.*

South Island orchid trip

Members of the Canterbury Orchid Society extend an invitation to members of NZNOG for 24-25 November.

We plan an early morning start from Christchurch, maybe a stop this side of Arthurs Pass where the club found orchids some years ago, and then our overnight base at Lake Brunner.

We're staying at a lodge at the lake (presumably at Moana), and we will probably have dinner at a member's place.

I have hired two 12 seater vans and I know some will travel by car. People are bringing their own food. I anticipate those taking the vans, the lodge and their own food will do it for \$100 max and maybe a lot less.

Contact Melanie Brigden, 11A Kimberley St, Casebrook, Christchurch, phone 03 359 9289 email lenb@ihug.co.nz.

Acknowledgements

Many thanks to Bruce Irwin for his inimitable drawings, to Brian Tyler for scanning them all and converting the notes to elegant typescript and to Ian St George for collating the drawings, then making the connection for the Column with *P. "Blyth"*.

Inside back cover

(photographs by Eric Scanlen)

Fig. 19. *Nematoceras* "tricraig" 15 Aug 05 at Rex Blumhardt's forestry farm, Klondyke Rd, Onewhero with pine pollen. Note the helmet rim to dorsal sepal is \pm level not sloping down at 45° as in *N. "tribrive"*.

Fig. 20. *N. "tricraig"* 11 Aug 05 at Pollok showing inner labellum hairs. Note **a.** the purple veins in the dorsal sepal, indicating a mature flower, **b.** drain hole below the egg pocket and **c.** the secondary bract up the front of the ovary, its tip just visible through the labellum apiculus.

Fig. 21. *N. "tricraig"* 28 Sep 05 at James Lowry's farm, Glen Murray, sectioned on the near side of centreline thus showing the egg pocket and the curiously dark surround to the pale column. The last is a rigorous feature in all the *Nematoceras*, possibly giving pollinators a pale bullseye to aim for, illuminated from the auricles either side.

Outside back cover

(photographs by Eric Scanlen)

Fig. 22. *Pterostylis* "Blyth" on Kodachrome II from a bigger colony than usual for this taxon so two good flowers could be caught together, by the Blyth Track, Ruapehu on 11 December 1968.

Fig. 23. *P. "Blyth"* at Littles Flat in the Kawekas on 6 December 1999. Typical are the curled ends of the lateral sepals and finger-like extension to the labellum, twisting to the right.

Fig. 24. *P. Blyth*" under black beech by Whakapapa Walk on 5 December 2003. The whole plant shows grass like leaves on a 130mm tall plant. The lichen on sticks lying about, was inserted for effect. Refer to Journal 87:7 for a reversed close-up of the flower alone.

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