

# NZNOG Journal



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Editor: Ian St George, 22 Orchard St, Wadestown, Wellington.  
Australasian Native Orchid Society liaison: Brian Molloy,  
Landcare Research NZ Ltd, POB 69 Lincoln, Canterbury.

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## Editorial

### The *Caladenia carnealcatenata* complex

When I described in my book an unnamed *Caladenia* species from various parts of the far south, I wrote that its "lip and column lack the red bars" (of *C. catenata*), then illustrated it showing such bars. Indeed, in some southern sites it does, and in some it does not have red bars.

Dan Hatch wrote in the paper co-authored by Noelene Clements in the last issue, "*C. catenata* - as I interpret it". It started me wondering about the NZ plants having affinities with *C. carneal*, and just how people did interpret them.

In 1949 Dan Hatch had classified *C. carneal* into three New Zealand varieties, distinguished, among other things, on the edges of the midlobe of the labellum. In *Flora II* (1970) Lucy Moore had simply lumped the lot as *C. carneal*.

Many of us will have bought (or got for Christmas) the delightful 1992 Australian coffee-table book *What orchid is that?* edited by Alec Pridgeon. It says of *Caladenia carneal*, "A very widespread species of eastern Australia which is often erroneously recorded

from other countries including New Zealand...." Oh, dear.

David Jones had included New Zealand in the distribution of *C. carnea* in his book published in 1988, but not in the distribution of *C. catenata*. His descriptions do nothing to clarify the difference - the distinguishing features he finds in *C. carnea* are the "prominent transverse red bars on the labellum and column and the clubbed labellar calli predominantly being in two rows". But it "is an extremely variable species which exists in a wide range of forms" (colour, habit, flower size, width and orientation of perianth segments, labellar features). *C. carnea* var. *minor* is "distinguished by its solitary small, pale pink flower with a plain green column". *C. catenata* "is closely related to *C. carnea* but has a much longer midlobe on the labellum and lacks the distinctive red bars on the labellum and column"; but on the other hand, "a form with bold, deep, red, green and white markings on the column occurs...". What is more *C. carnea* "hybridises with *C. catenata*".

In 1989 Mark Clements listed New Zealand and New Caladonia in the distribution of *C. carnea* R.Br. var. *carnea* R.Br. (1810), [with synonyms *C. carnea* var. *bartlettii* Hatch, and *C. catenata* forma *carnea* (R.Br.) Halle]; and in the distribution of *C. catenata* (Smith) Druce (1917), [with synonyms *C. alba* R.Br. and *C. carnea* var. *alba* (R.Br.) Benth.].

He equated other names as follows: *C. carnea* var. *alata* (R.Br.) Domin. = *C. alata*; *C. catenata* var. *exigua* (Cheesem.) = *C. alata*; *C. carnea* var. *minor* forma *calliniger* Hatch = *C. iridescens*; *C. carnea* var. *minor* (JD Hook) Hatch = *C. minor*; *C. catenata* var. *minor* (JD Hook) WM Curtis = *C.*

*minor*; *C. carnea* var. *pygmaea* R.Rogers (for the most part) = *C. minor*.

Unfortunately Clements did not detail the morphological reasoning behind his classification. But in his view the New Zealand species are *C. carnea* var. *carnea*, *C. catenata*, *C. alata*, *C. iridescens*, *C. minor* (and of course, *C. lyallii*). [I would add the undescribed *C.* "green column", and the small *C.* "aff. *lyallii*" (of Max Gibbs) from Iwitahi].

Most of us would have no problem in recognising that dull-coloured plant imaginatively named *C. iridescens* (with its dark brown labellar midlobe and calli), and *C. lyallii* (the larger size, distinct four rows of calli, etc); I have never seen *C. alata*, but it is apparently easy to distinguish.

The differences among *C. carnea*, *C. catenata*, *C. minor* and the apparently undescribed plants are what cause my headaches.

I sent seven slides of the representatives of the complex as I have found them to our three leading native orchidologists, and asked them to identify them and to tell me how they decided. Now I admit asking people to identify species from slides is unfair, but I would have expected some agreement. As it happened, they were unanimous on none of the seven slides, and two experts agreed on only one.

Let me hasten to add, this is not criticism of any of the experts: I chose them because of their recognised skills. It simply reinforces what David Jones wrote in *Native orchids of Australia*: "A detailed study of the complex is badly needed".

In the meantime, perhaps we should refer to these plants as members of the "carneal/catenata complex", and go no further; I intend to do just that with the Mapping reports.

Ian St George.

## Original papers

### Focus on orchids - part 2 by Gordon Watson, Invercargill

In the last issue I spent time discussing light which is so important. You may have heard the saying "Painting with light"; well, that is just what photography is all about. Do use soft light to the fullest, experiment, and enjoy the good results.

**Tripod.** This is a necessary piece of equipment for any photographer, but more especially the nature worker. In the bush with minimal light and long exposures, a sturdy tripod is a must to allow pin sharp exposures. It is difficult to get successful hand held exposures slower than 1/60 second, so it is wise to fix your camera onto some firm structure. As a last resort use a rock, bag of sand, log or a post. Or try a human tripod by lying on your stomach with camera held firmly against your face and elbows planted wide apart into the ground - and now look the orchid straight in the face. Beware some cameras allow reverse light through the viewfinder which upsets your exposure when your face is not there to block it out. Always use the shutter release cord to prevent camera movement from resulting in foggy or unsharp images. If you find the tripod a nuisance to carry on field trips why not attach a strap to it and sling it over your shoulder?

**Background.** Too many good photos are ruined by having messy or untidy backgrounds. Do look beyond your bloom and don't press the shutter until you are satisfied that the background is respectable. If you want the background to feature in the picture make sure it is compatible with the subject. All dead leaves, foreign materials, especially if

light coloured, misplaced leaves or stems, or out of focus blooms should be removed or placed out of view. We call this "gardening". It does help. I believe that no background is better than a messy background. To lift your subject and make it stand out from the rest of the picture an excellent method is to throw the background out of focus. By slightly adjusting the camera's focussing ring it is possible to throw the background out of focus without losing any sharpness of the subject. Probably a better method is to use a larger aperture, even down to f4. Opening the aperture shortens the depth of field, to isolate the subject so the background becomes a soft blur. Try this. It is an excellent ploy. If your camera has a preview ability make use of it to perfect your image. If you alter the aperture remember to adjust the speed accordingly. Another method of producing a tidy background is to use a painted cardboard, but be sure to blur it out of focus.

**Metering.** If you rely solely on your camera meter, don't forget to have it checked occasionally. When metering, as a general rule, for slides meter the highlights, and for prints meter the low lights. Have you ever been embarrassed by meter failure and no fresh batteries to hand? Remember this "f16 sunny rule". This means that on a bright sunny day at f16 combined with camera speed setting equal to your film ASA excellent photos will be obtained. If the day is other than sunny bright use equivalent combinations. Try it, it works. Have you found out that automatic cameras cannot be relied on to give correct meter

readings? Beware of accepting the reading when metering white or bright subjects or directly into the light. You must understand that meters are set to operate at 18% neutral grey tones so to get true colours one must override the reading and overexpose by one or two stops. Likewise blacks should be underexposed. The occasion may arise

when it is difficult to get a reading off your subject. Try taking a reading off the back of your hand with the camera about 8 inches or so distant, making sure the direction of light is the same as on the subject. To get a true response, always take a reading with the meter about 6-8 inches from the orchid.

*(To be continued).*

***Wild orchids in the far south of New Zealand***  
by Ian St George

"... a masterful understatement for a gem of a book...."

"The many pen and ink illustrations by the author accompany delightful descriptions of each species. The accounts are lifted by short but fascinating historical notes about each of the orchids. The enthusiasm of the author for his subject is infectious. This pocketable book at a pocketable price is highly recommended." - *Otago Daily Times*.

Available from the editor at \$11 including p&p.

**THE SECOND AUSTRALASIAN NATIVE ORCHID SHOW**  
17-19 September 1993  
at the University of Southern Queensland, Toowoomba.  
Enquiries to the secretary, NOST, POB 2141, Toowoomba 4350.

***Australian indigenous orchids Volume 1:***  
*the epiphytes; the tropical terrestrial species*  
by Alick W Dockrill

Bigger than the 1st edition, crammed with up-to-date information. 566pp, 165 mono and 68 colour illustrations. NZ\$110 from the editor.

Help wanted

This new section is provided as a forum for questions you want answered, either via the columns of the *Journal*, or privately. Please feel free to use it.

\* Allan Ducker asks how far north *Corybas macranthus* has been recorded? The Mapping Scheme has records from Ecological Regions 9, 10, 12, 13, 15-26 and southwards. Can anybody be more specific?

\* Margaret Menzies's report in the March *Journal* reminded me of the great elongation of the stalk of *Corybas corymbosus* in fruit and seed.

I was struck by this *Corybas* survival tactic on 17 January in the Rimutakas: *C. cheesemanii* were very easy to find, with slender stalks up to 18cm emerging from the tiny leaves buried in the litter; *C. oblongus* had rather more stout stalks of 12cm; *C. trilobus* 10cm. Do all the *Corybas* species elongate in that way? I don't recall seeing the phenomenon in *C. macranthus* or *C. rivularis*. Please write in with your observations - Ed.

\* I have noticed what seem to be two distinct forms of *T. pauciflora*: the first one I found at various sites in Otago - early-flowering (October/November), pale, 1-2-flowered, barely opening,

rounded petals and sepals, pale column; the second at Iwitahi, Kaitoke, Haurangi range, etc - later-flowering (December), many-flowered, dark mauve, deeply coloured column, sharp-pointed sepals and petals (I haven't seen it open). I sent a specimen of the latter and my slides of the former to Bruce Irwin, who suggested the former was similar to an unnamed plant known from the far north to Taupo - what he calls "pseudopauciflora". He notes the differences in the table.

What have others observed about the flowering times and other characteristics of the plants we call *T. pauciflora*? Certainly the columns of these two are structurally similar, but with the number of *Thelymitra* species it would be surprising if two did *not* have similar columns: perhaps we have relied too much on the structure of the column in identification of the *Thelymitras* [as perhaps we have on the hallowed two rows of calli (*cf* four) for identification of the *Caladenias* - see editorial in this issue] - Ed.

	<i>T. pauciflora</i>	<i>T. "pseudopauciflora"</i>
colour	dark mauve, base <i>stippled</i> red	dusky mauve, base <i>stained</i> red
flowers	many, large	fewer, smaller
flowering time	late	early
petals, sepals	narrow, pointed	broader, more rounded
column:		
midlobe apex	thin, tapered, rolled under	blunt
colour (back)	black-purple	bronze-brown or bright red

Notes

\* On 17 January in the Rimutaka Forest Park (E.R. 39) I again noted the green form of *Gastrodia cunninghamii*. I had wondered in the past, after encountering pale green plants under beech in Otago, whether this was really the same as the usual black ones. In the Rimutakas I found a group of plants - two green, three black, and an intermediate tan. They seem indeed to be colour variations of the same species - Ed.

\* While at Iwitihi I was again struck by the difference between the two forms of *Caladenia lyallii* that Max Gibbs had noted (see NZNOG Journal 1990; 35: 19, and plate 20 of *The NZ orchids: natural history and cultivation*). They are quite consistently different in size and colour, and there appear to be no intermediate forms at Iwitihi. The large-flowered one matches the *C. lyallii* I know from Otago, though the Otago plants are more likely to have red markings on column and labellum. The small-flowered plant is in my view an undescribed species (or is it Colenso's *C. variegata*?) closer at least in size to the *C. catenata* group than to *C. lyallii* (despite the sacred four rows of labellar calli) - Ed.

\* Bruce Irwin wrote (27 February 1992) after comparing specimens of the yellow-green form of *Orthoceras novae-zeelandiae* with the usual form:

"As I expected, I found no differences apart from colour.

"Because in *Flora 2* Lucy Moore said the pollinia were 'ill-defined', I made careful drawings of them. When I tipped the anther back, the pollinia were withdrawn because they were cemented to the back of the stigma, presumably by

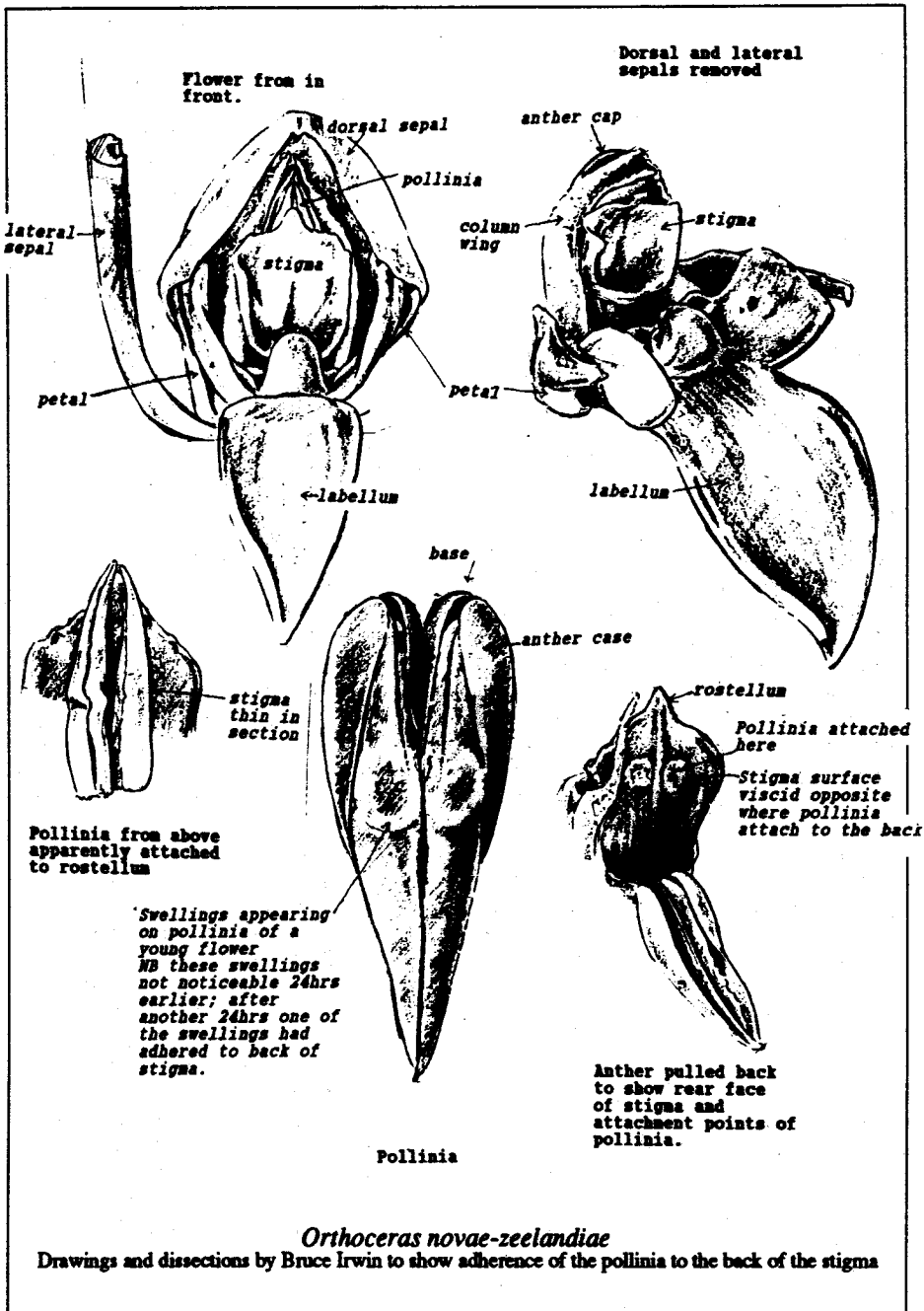
germinating pollen tubes. This suggested that pollen tubes penetrate through the back of the stigma.

"Having made drawings of the first flower I tipped back the anther of the second flower to make sure I had not been misled. I was surprised that in this case the pollinia were not attached to the back of the stigma. I returned the anther to its normal place and re-examined it 24 hours later. By then two pale slightly swollen areas could be seen, one on each pollinium. After a further 24 hours one pollinium was attached to the back of the stigma."

*A flower I dissected on 24 January 93 had its pollinia so adherent to the back of the stigma that they could only be prized off carrying some of the sticky stigmatic material with them.*

*Many of the New Zealand orchids are adapted for self-pollination (autogamy) which, as Brian Molloy has written, is uniquely common here. Bruce Irwin's note is a fascinating challenge to the assertion that a prominent rostellum separating anther and stigma suggests insect-pollination.*

*G.M.Thomson presumed (1878) that pollen grains attached to the back of the stigma of *Thelymitra longifolia* emitted tubes, but "never succeeded in detecting this"; two years later T.F.Cheeseman noted (of *T. longifolia*): "The upper part of the stigma is thin and membranous, and has its margin slightly revolute, even when in bud. After expansion this rolling back is carried to a greater extent, so that the edge of the stigma, and even a small portion of its anterior surface, comes into contact with the pollen masses directly behind it. Pollen tubes are at once emitted into the substance of the stigma..." - Ed.*



\* Val Smith wrote (5 April), "My pessimism at the start of this last orchid season was unfounded, and I would like to share my unanticipated personal highlights with you.

"The first was at the Iwitahi weekend in December, seeing for the first time *Gastrodia minor*. Growing on the road verge and with its flowers not yet opened, its distinctive "hairpin" stem nevertheless should help me identify it in future.

"The Wellington Botanical Society's New Year trip to the South Island yielded a number of orchid species.

"On Mt Somers, *Adenochilus gracilis*, *Chiloglottis cornuta*, *Caladenia lyallii* and *Prasophyllum colensoi* were all seen in flower; *Aporostylis bifolia*, *Gastrodia cunninghamii*, *Thelymitra* sp. and *Microtis* sp. in bud, and leaves only of *Corybas trilobus*. However, the highlight for me was finding a flowering plant of *Pterostylis* aff. *cynocephala* growing in open sheep pasture towards the end of the walkway. The plant had three light green striped flowers on its approximately 8cm stem held above a rosette of five pale green leaves. (I had been shown a few fruiting plants last year in Central Otago, but this was the first and only one I have seen in flower).

"On nearby Mt Winterslow we again saw *Adenochilus gracilis* and *Chiloglottis cornuta* in flower, and *Aporostylis bifolia* and *Thelymitra* sp. in bud.

"The weather at Mt Peel was not conducive to botanising, and orchid finds were limited to *Microtis unifolia* in flower on the roadside, and leaves and a few seed capsules of *Corybas rivularis* and *C. trilobus* in the bush - just a small portion of the eleven genera and eighteen species of the Mt Peel Range noted in the DoC information panel.

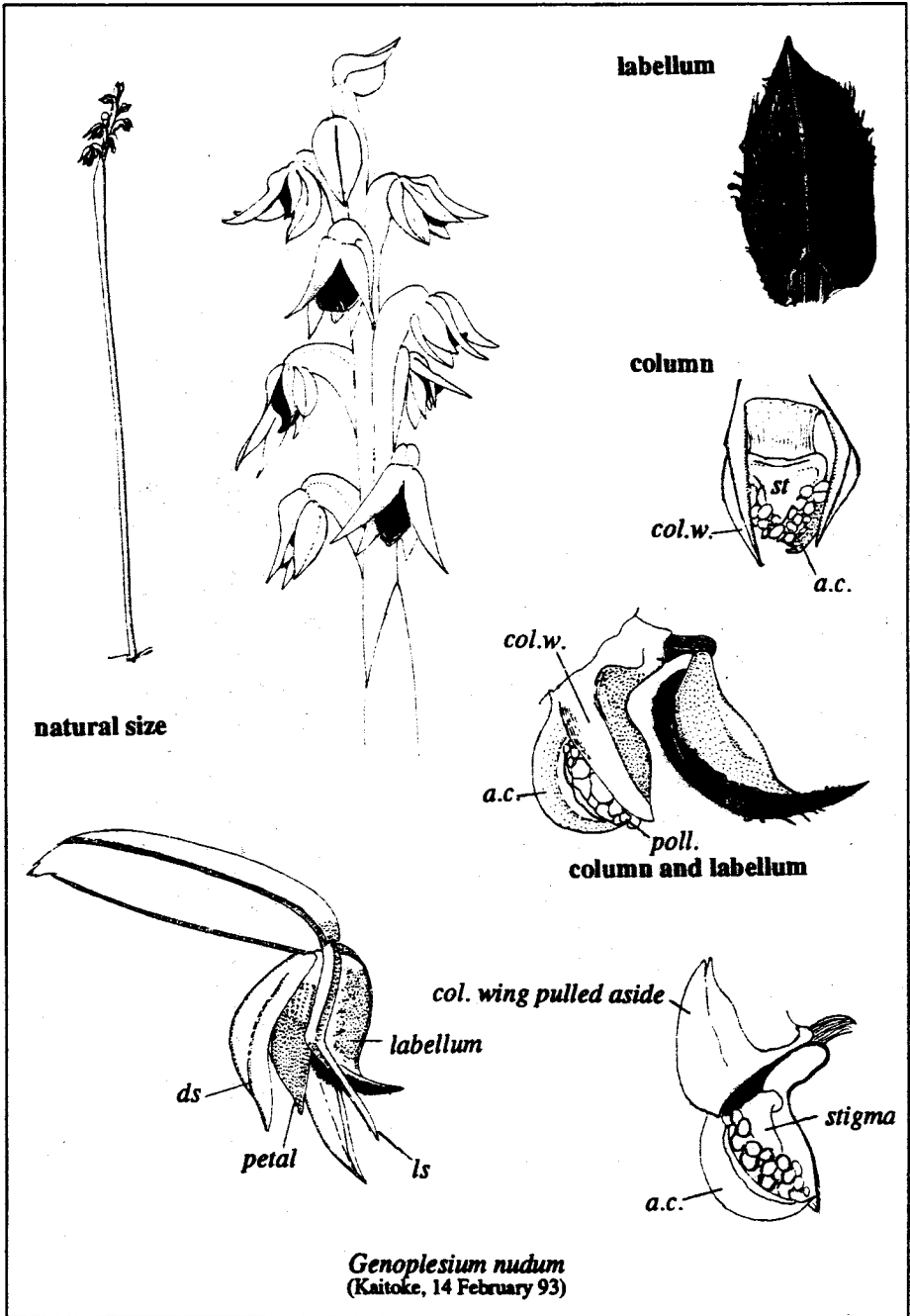
"Some of us drove to Mesopotamia further up the valley to escape Mt Peel's rain, and in the shingly river flats found

*Microtis unifolia* and *Prasophyllum colensoi* in flower.

"Back in Taranaki, phone calls from Margaret Menzies took me twice to Omoana to see her finds of what we believe were seed heads of *Corybas cryptanthus*, and a colony of *Genoplesium nudum*, another species I had not previously seen. I will admit that at first I had considerable difficulty seeing the fine grasslike plants of *G. nudum* among the other vegetation under manuka, even when Margaret pointed them out. There were about 20-30 plants scattered in a fairly small area, and they ranged from nonflowering juveniles about 4cm tall, to a few up to 20cm, very slender, with about 5-10 flowers per stem. In the 2-3 weeks since Margaret first noticed them in bud, all except two plants had flowered and shrivelled; of these two, one was still in bud and the other barely out.

"In mid-March I had a very enjoyable three and a half days on Great Barrier Island with our North Taranaki Forest and Bird group. On the first walk a small creamy-white flowering stem almost leapt up at me from a rocky trackside! Could it be...? Yes, it was... *Genoplesium pumilum*, another new orchid to me, although subconsciously I was probably watching out for it as I had checked various orchid flowering times in Dorothy Cooper's book before I left home. There were three plants in this first area, but on another track on another day they were quite common, growing on the parched bare ground among low manuka. Plants varied from 10-12 flowers on 4-6cm stems to countless numbers of flowers densely packed on slightly taller plants, but still a long way from Dorothy Cooper's "up to 40cm". The magnifying lens revealed very attractive yellow-green with a touch of pink flowers, to those who stopped to look.





"Further along this track, as it followed the edge of the swamp, I noticed among the reeds tall seed-heads of *Spiranthes sinensis*, some still with a few flowers at the top (19 March).

"Other orchids seen on Great Barrier Island were *Earina autumnalis* growing and flowering on the ground under low scrub, *E. mucronata*, *Dendrobium cunninghamii*, *Bulbophyllum pygmaeum* still with a few shrivelled flowers, growing on the underside of a 'grandfather' pohutukawa branch, *Orthoceras novae-zeelandiae* and *Thelymitra* sp. seedheads, and leaves of *Corybas oblongus*.

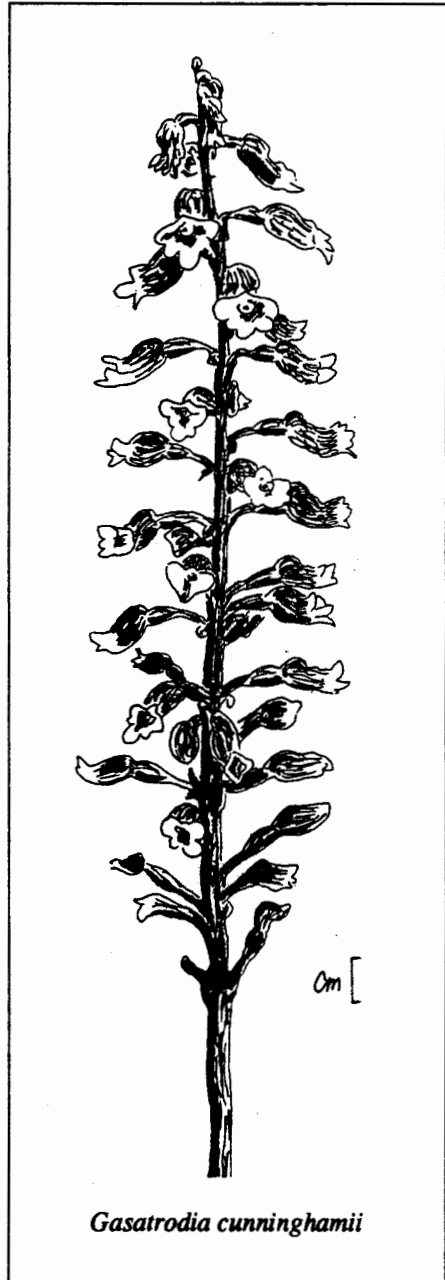
"A non-orchid highlight: the lower Kauri dam on Hirakimata!"

\* Graeme Jane wrote news from the Nelson Botanical Society in the NZ Botanical Society *Newsletter* of March 1993, including a visit to Whangarae Bay in November where they encountered "masses of orchids such as *Earina mucronata* in full flower. *Cyrtostylis reniformis* just finished flowering, and *Thelymitra pauciflora*? coming into bud."

The summer camp was based at Dip Flat in the upper Wairau Valley, where "short trips close at hand revealed quite an array of orchids including *Gastrodia cunninghamii*, *Chiloglottis cornuta*, *Thelymitra longifolia*, *Adenochilus gracilis*, *Pterostylis graminea* and an abundance of a large *Pterostylis* in full flower which resembled a broad leaved *P. banksii*."

At the Serpentine Creek flats near Lake Tennyson were "numerous *Pterostylis tristis* in full flower".

The January field trip was to Red Hills: "In the wet areas they found a variety of orchids including *Caladenia lyallii*, *Microtis unifolia*, *Prasophyllum colensoi* and *Thelymitra decora*...."



*Gastrodia cunninghamii*

At the Pupu walkway near Takaka "the most abundant orchid was *Acianthus sinclairii*, but others were *Orthoceras novae-zeelandiae* and *Corybas rivularis*."

\* *Sample catalogues of flasks of Australian native orchid species and hybrids from "Florafest Orchids" of Toowoomba have arrived: write to them at POB 7011 if you are interested - Ed.*

\* Graham Marshall wrote, "Allan Ducker, Sue Bergeson, myself and another orchid enthusiast made a trip to Mt Auckland in the first week of February to find *Yuania australis*. After two hours searching all we could find were two small *Yuania* with seed capsules open, so it must have flowered early January; we have marked the area and will go back early next time."

\* Dan Hatch wrote, "Bruce Irwin's delightful (and accurate) note in the last issue on the cantankerous *Corybas cryptanthus*, which fooled me (I described it) as well as Lucy Moore and himself, prompts me to mention another orchid in which the petals go on growing after the flower has opened. In *Yuania australis* this gives the illusion of an emarginate tip to the dorsal sepal."

\* Pat Enright wrote (22 Feb), "A new record for Otago Peninsula is *Microtis oligantha* which grows on the bank behind Lovers Leap along with a *Pterostylis* sp. (in seed) and *Corybas macranthus*."

"Last Saturday I went with the Dunedin Naturalists' Field Club to Garden Gully in the Blue Mountains at the head of the Rankleburn (E.D. 68).

"In the beech forest there were *Corybas trilobus* with the odd seed

capsule, very abundant; *Adenochilus gracilis* also in seed, infrequent; *Chiloglottis cornuta* mostly seeding but still the odd flower, common; a lone *Gastrodia cunninghamii* - I have never seen it in flower before - it certainly has a lovely scent; *Aporostylis bifolia* seeding, common in the boggy bits; and *Lyperanthus antarcticus* in boggy clearings, rare - these plants were up to a foot high compared with the plants on Maungatua which managed three inches or so.

"Out in the tussock I found a solitary *Thelymitra cyanea* in flower and the odd *Prasophyllum colensoi* just going over."

\* Sarah Beadel and Derek Gosling very kindly showed me a site near Taneatua where they have been watching *Bulbophyllum tuberculatum*, on the north sides of rewarewa, mapou and kohuhu. It was in full flower on 11 April there. I was struck by the purple undersides of the leaves - as T.C. Moss noted in 1968 (see *Historical reprint* in this issue) - Ed.

\* Allan Ducker wrote (18 April), "...was up at the Waitakere Ranges (17 April) and found *Bulbophyllum pygmaeum* with 2-3 flowers on kauri and *Knightia excelsa*. Also found rosettes of *Pterostylis trullifolia* in abundance, and *P. alobula* with not as many present. The best find was *P. alobula* with 3 heads wide open and 3 others about to open. *Acianthus sinclairii* still not too obvious - only the odd colonies showing leaf and the odd plant with the flowering stalk only a few millimetres above the leaf. Also found 6 leaves of *Cyrtostylis oblonga* or *reniformis* - I really thought it was quite early for this." - *I found P. alobula in flower at Cook's Cove, Tolaga Bay at Easter - Ed.*

## Orchid artists

### Jessie Brownlee (1870-1952)

Jessie Brownlee (nee Brown) was born of Scottish, Maori and English descent in Melbourne, where her parents had settled after leaving New Zealand.

In 1875 they returned to Taranaki, and Jessie attended school at Waitara and Urenui. She and her sisters drew and painted in their leisure time.

The young women kept sketchbooks on a visit to England in 1893, and continued these on their return, to Auckland. Jessie's interest in natural history led to her writing articles and drawing illustrations in local magazines. The *Graphic* carried one of her paintings of native flowers in 1905 and one of berries in 1906.

George Brownlee was a public servant in the Railways Department. They were married in 1909 and went to work at Ohakune junction in the King Country. The bush was everywhere, and here Jessie began her life as a botanical painter, painting with improving technique the specimens she had collected at the weekends. Her interest kindled by the strange specimens brought to her by amateur collectors, she began to correspond with professional botanists, and to gather for herself a reference library.

In retirement they moved back to Auckland where she enrolled in Botany classes at the university. She made friends with local botanists, filled her garden with native plants from all over the country, and began to spend much of her time painting, her studies in botany ensuring the accuracy of her work.<sup>1</sup>

Lucy Cranwell borrowed many of her watercolours to hang in the Museum, but with fading from the strong light, they

had to be taken down and are now stored in the Museum collection. There are nine studies of native orchids dated 1916-1932, among them a page of spider orchids, labelled with different dates and clearly intended as a key to the genus: "(1) *Corysanthes triloba* Ohakune (King Country) Sept 22nd/16, (2) *C. rotundifolia* Jan 1st Hinuera Gorge, (3) *C. rivularis* Sept 1st Waitakerei Spragg's Bush/27, 2 in stalk from leaf to base of plant, (4) *C. Cheesemani* Henderson Valley May 14th 1927, (5) *C. ---* Te Aroha about 600ft near Bald Spur Sept 12th 1927, (6) *C. oblonga* Ohakune Nov 5th 1917, (7) *C. ---* Orewa Sept 1st 1932."

In 1934 she illustrated Laing and Gourlay's "Vegetation of the Bealey River" with "Three forms of *Pterostylis* from creek near Gaya Cottage, Arthur's Pass" (see figure);<sup>2</sup> one of these Lucy Moore identified as *Pterostylis irsoniana*,<sup>3</sup> described by E.D. Hatch in 1950.<sup>4</sup>

#### References

1. I am indebted to Eleanor Spragg for biographical details.
2. Laing R.M. and Gourlay H.W. Vegetation of the Bealey River basin. *Transactions of the Royal Society of N.Z.* 1935. 64: 10, Plate 1.
3. Moore L. and Edgar E. *Flora of New Zealand*, Vol II. Wellington, Government Printer, 1970. p 147.
4. Hatch E.D. The epiphytic orchids of New Zealand and a new species of *Pterostylis* from Mount Egmont. *Transactions of the Royal Society of N.Z.* 1950. 78: 104.



Jessie Brownlee's "Three forms of *Pterostylis* from creek near Gaya Cottage, Arthur's Pass" from Laing and Gourlay's "Vegetation of the Bealey River".

## Australian notes

\* R. Bates reports (NOS of South Australia Journal 1993; 17 (1): 2-3) a trip to Kangaroo Island where no less than seven undescribed and a number of rare species were found - including *Thelymitra matthewsii*, still recognisable by its spiral leaf and a single flower. This was exciting as *T. matthewsii* is an endangered species, only seen once on Kangaroo Island before".

\* Helene Wild and Tony Slater reported the work of pollination biologist Rod Peakall in NOS of South Australia Journal 1993; 17 (1): 6-7. He has been working on the pollination of Australian terrestrials for eight years - using techniques like plotting distributions in the field, extracting fragrances from flowers, studying pollinator behaviour, injecting pollen with dye then looking at local flowers to see how far the dyed pollen is taken, and experimenting to see which parts of flowers attract pollinators.

*Cyrtostylis*, *Microtis* and *Prasophyllum* produce nectar. *Diuris* does not, but looks like a pea that flowers at the same time and does. The cilia of some *Thelymitra* mimic the anthers of lilies. *Caladenia*, *Drakea*, *Cryptostylis*, *Chiloglottis* and *Pterostylis* are all pollinated by pseudocopulation - by mimicking either the appearance or the scent of females of certain wasps or gnats.

\* R. Bates wrote in NOSSA Journal of November 1992, under the heading *Pterostylis plumosa* Cady in South Australia, "The yellow-plumed greenhood or *Pterostylis plumosa* is one of our most distinctive and widespread

orchid species, occurring from Streaky Bay on the west coast as far north as the Flinders ranges, across into the eastern states and onto Kangaroo Island. It can be locally common....

"For many years it was thought to be just a form of the Western Australian *Pterostylis barbata* and was first recognised as distinct by Leo Cady of Kiama, NSW, co-author of Cady and Rotheram's *Australian native orchids*.

"*Pterostylis plumosa* and *Pterostylis barbata* are really just part of a complex of as many as a dozen species, mostly in Western Australia (see Hoffman and Brown for illustrations of some of the western species).

"Compared to Western Australia there is little variation in the appearance of South Australian plants from district to district, but there are three distinct forms, perhaps subspecies, which can be recognised. The common form occurs in dry, usually fertile soils in woodland and mallee. This is the form which grows in the Adelaide Hills. Plants are robust with colourful yellow plumes, strongly outcrossing flowers and with little or no brown around the orifice of the hood.

"On Kangaroo Island plants are less robust with smaller flowers, less brilliant plumes and with a brown orifice to the hood. This form is confined to the Island.

"In the South East two forms occur, the common form being found in dry fertile soils. The second is a dull, short segmented, self-pollinated taxon which occurs in poor acid sands in damp sites. This latter plant extends through southern Victoria and into Tasmania in similar habitats."

## Historical reprint

The following is reprinted from the *Bulletin of the Wellington Botanical Society*, October 1968, pages 36-39.

### Notes on *Bulbophyllum tuberculatum* (Orchidaceae)

T. C. Moss, Wellington

ON 25th May 1968 a colony of *B. tuberculatum* was discovered on a limb torn from an old rimu by the storm of the 10th April. This rimu emerges above a canopy of kohekohe-tawa forest about 40 ft high, on a 350 ft ridge to the north of Paraparaumu.

There was quite a community of orchids scattered along the fallen branch — all epiphytic species except *Earina autumnalis* and the doubtful "*E. aestivalis*" were there. *Bulbophyllum tuberculatum* tended to occur higher up the smaller branches than the other orchids, in positions where it would be partly or entirely shaded by the rimu foliage overhead. No asteliads were on this branch. The orchids derived their nourishment from a thin layer of material built up from rather sparse patches of *Pyrrhosia serpens*. *Bulbophyllum tuberculatum* seemed to prefer positions where this fern was on the wane, but before the fibre thus laid bare had been occupied by crustose lichens. The accumulation of peaty material would be slow at this height. It was augmented a little, however, by a few small rotting stubs of rimu branches and tiny pieces of rimu foliage.

The pseudobulbs are arranged sympodially on a rhizome which runs above, or is slightly embedded in, the substratum. Roots which emerge from the rhizome and occasionally from the bases of pseudobulbs are no thicker than those of *B. pygmaeum* but much longer — sometimes extending to about 10 cm. They are sometimes sparingly branched. Apparently they can grow over bare bark if the atmosphere is not too dry. Pseudobulbs in all stages of development were present, but it was not noted whether the roots were growing or dormant at the time of discovery. A few juvenile plants of various sizes were dotted about the branches.

The turgid or finely wrinkled pseudobulbs, especially when young, bear upon their surfaces fine white mealy scales which probably protect the underlying tissue from excessive light while it is developing. This covering gradually weathers away but persists longest near the top of the pseudobulb. It is seemingly not composed of scales attached by their bases to the epidermis, but rather is derived from the breaking up of one or two membranous sheathing leaves which tightly cover each pseudobulb in its infancy. As each tiny fragment breaks away it appears somewhat bullate for a while before shrinking up into scattered mealy specks. The sheathing leaves are therefore most obvious on the

younger pseudobulbs, from the tops of which their apices curve outwards a little. Sometimes the apex of the inner sheathing leaf is faintly photosynthetic for a while.

The thinly coriaceous leaves tend to be narrow-elliptic to lanceolate or oblanceolate in outline. Each leaf is folded upon itself where it joins the pseudobulb to form a small false petiole which is capable, especially when young, of twisting to orient the rest of the lamina in relation to the light. The glabrous dorsal surface has a fine median groove. Ventrally it is either faintly keeled or has a darkish midrib. This surface is peppered thickly with minute whitish specks which, to the naked eye, look like a faint silvery grey film. Where the plant in growing in strong light a purple pigment is developed which is especially noticeable on the ventral leaf surfaces, peduncles, and developing capsules. Indirect light seems to be preferred.

Small inflorescences are produced from the bases of pseudobulbs, whence they reach a position about half the height of the leaves, if these are vertical. A second spike may develop from the base of an earlier one. The peduncles persist as dry brownish threads. Only one complete flower, partly open, was seen, and it agreed with Colenso's description in *Trans. N.Z. Inst.* 22, 1890, p.488 quite well. (The drawing in Cheeseman's *Illustrations of the N.Z. Flora* Vol. 2, 1914, Plate 191 depicts the flowers with the corollas open, which may or may not be accurate.) Seen from the front, the sepals formed a little hood over and about the labellum which presented its upturned ventral surface to view. This was red, fading to yellow in the middle.

This colony had sufficient numbers of individuals for one to see that it could adapt to different microclimates. Some plants on exposed branches had smaller, suborbicular pseudobulbs, with correspondingly reduced leaves carried more or less horizontally. In one place some pendent lichens of the *Usnea* type had become entangled amongst the orchid leaves. The affected plants had produced ovate pseudobulbs up to about  $11 \times 7$  mm, and the leaves were more parallel-sided and measured up to  $27 \times 5$  mm. They were held vertically so that only their tips protruded through the lichen. Plants in this condition could produce flowers under or within the lichen.

From its well-lit perch 50—60 ft up in the rimu the colony had been plunged to the gloom of the forest floor, where it had remained for six weeks until found. If *B. tuberculatum* were very sensitive to environment one might expect this to have had some traumatic effect. However it appeared to have weathered the misfortune as well as any of the other species present, which strengthens the impression it gives of being tough and adaptable. Why then is it so uncommon?



The present plants were certainly not conspicuous. Colenso's specimen sent from Palmerston North in April 1889 (loc. cit.) was described as forming "pretty large and closely matted masses", but this was probably enjoying much less spartan conditions than the Paraparaumu plants. Colenso first described this orchid from preserved material obtained near Petane (*Trans. N.Z. Inst.* 16, 1884, p. 336) and gave the lamina as "thickish but not fleshy", a description which he confirmed later. In Cheeseman's *Manual of the N.Z. Flora* (1925) we read "leaves  $\frac{1}{2}$ —1 in., thick and fleshy". This, if correct, suggests a specimen from a much less xerophytic habitat than the present ones, some of which gave the impression of being near the limits of tolerance to exposure.

One factor limiting its spread is its own growth form. All specimens seen were spot-bound as a result of the very short internodes on the rhizomes. These are much shorter than the diameter of the pseudobulbs, resulting in plants which are more tightly tufted and prone to being overwhelmed by other epiphytes than those of *B. pygmaeum*. Also, an older plant has an outer zone of vigorous growth surrounding an inner area of leafless, dying pseudobulbs with senescent or moribund roots. Any new growth emerging from a "backbulb" would be forced up into the air above the closely packed old pseudobulbs about it. It would prosper only if a fresh layer of organic material was deposited over these old pseudobulbs, and this is not likely to occur on the top of an old rimu. The only escape from these restrictions is by seeding and germination in fresh localities. *Bulbophyllum tuberculatum* seems to be more seral than the other epiphytic orchids, though in circumstances not conducive to rapid succession (as they might well not be on exposed rimu branches) a colony could persist for many years.

No plant was seen growing in fibre more than about half an inch thick. This fibre is what an orchid grower would call "dirty", i.e. much of it was decomposed into a very fine black material. Epiphytic orchids rarely take kindly to this sort of growing medium which, if present in too great a volume, will cause their roots to die prematurely. *Bulbophyllum tuberculatum* seems to avoid this by colonizing only thin and better drained patches of this material, but in so doing exposes itself to the peril of greater desiccation.

All plants seen seemed free of any serious disease. The remains of a few narrow oval white scale insects were found on the undersides of some leaves, and a few tiny lichens were present on some of the older pseudobulbs. Several plants had been overwhelmed by crustose lichens.

It would be interesting to hear of any other recent discoveries of this orchid, and whether anyone has successfully maintained it in cultivation.

## New Zealand Native Orchid Group

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## Taranaki *Corybas* crawl

Come to north Taranaki on 18-19 September 1993 and see our *Corybas*.

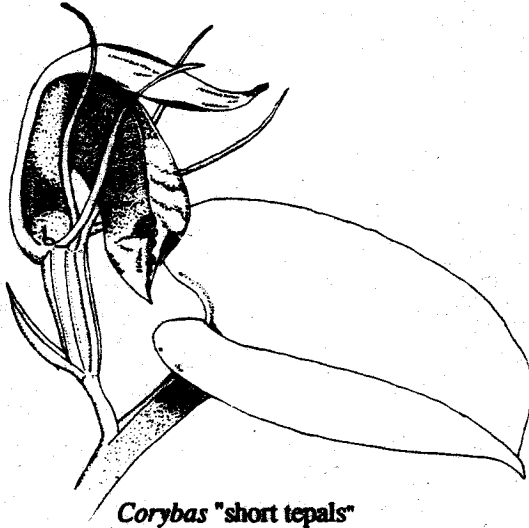
Enjoy a weekend such as Audrey Eagle described in the March issue of the *Journal* (No.45: p2).

A native orchid weekend is to be held with a base at Wai-iti Beach Motor Camp, 40km north of New Plymouth. The turnoff to Wai-iti Beach will be signposted with a NZNOG emblem, as will the Uruti turnoff where the *Corybas* are.

Clothing and footwear for wet conditions will be necessary.

Saturday evening dinner will be provided at \$10 per person.

Enquiries to Ernie Corbett, 10 Protea Place, Bell Block (phone 06-7550563 evenings), or to Ian Rutherford, 35 Grenville St, New Plymouth (phone 06-7510153)



*Corybas* "short tepals"

(This one was found in Otago, but you will see it in Taranaki in September)

### *The orchids of southwest Australia*

by Noel Hoffman and Andrew Brown

"This definitive work describes almost 400 orchids .... For every orchid there is a colour photograph and a map of its distribution.  
NZ\$85 if ordered by 1 October - from the editor.