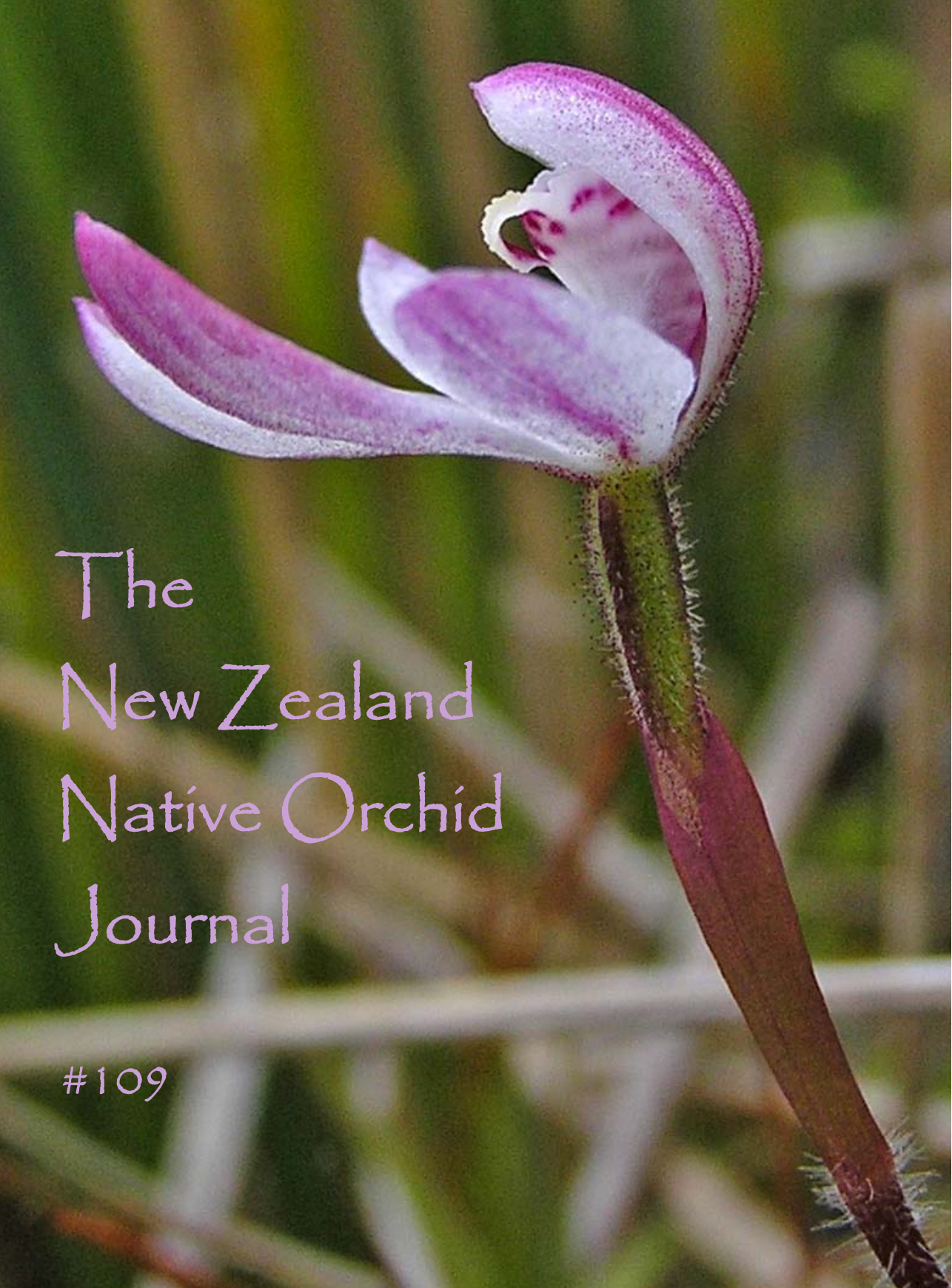

The New Zealand Native Orchid Journal

#109

Fig.1: The fungus *Armillaria limonea* from the Mangonui Forest.
Photograph by Kevin Matthews (see p.22).
Might this be the mycorrhizal fungus for *Gastrodia cunninghamii*?

Contents: No. 109

August 2008 ISSN 1177-4401

Cover

"*Stegostyla alpina* 23 Dec 2007 by Georgina Upson at 1,300m up on Mt Arthur, Nelson single flowered due to drought but with its carmine tepal outers, 225° midlobe curl, green ovary with red sepal ridges, green to red bract and red peduncle" (The Column, p.31).

Original papers

The Type locality

Close relations: orchids like ours

Elementary: ED Hatch

Eponymous orchids: Val Smith

Notes, letters, questions, comments

Australian notes: David McConachie

The column: Eric Scanlen

Original papers

Nematoceras "whiskers" variation in the Nelson region

By Georgina Upson

As a keen amateur botanist I have great difficulty defining the plant described in manuscript by H.B. Mathews as "Corysanthes viridis" and today bearing the tag *N.* "whiskers". During 2006, a preliminary investigation into *N.* "whiskers" variability in the Nelson area had interesting results. This season's inclement weather, bringing floods, left me frustrated, searching for more widespread colonies to study and a few more tantalizing finds.

There are two sites that I have spent the majority of my time in. One site is in the hills to the east, the other to the west of the Waimea plains. A brief skirmish to the Tinline area added an extra dimension.

The Eastern site is a damp, exposed rock outcrop dropping into a river. Little direct sunlight with no overhanging vegetation leaves the area with a comparatively high light level. Vegetation is largely mosses and creeping plants. Both *N*. "whiskers" and *N. orbiculatum* are present.

The western site consists of rock shelves jutting into a large stream with dappled shading from overhead trees. Mosses and creeping plants also form the vegetation here. Only *N*. "whiskers" is present but *N. acuminatum* is to be found nearby. 100mm of rainfall in one hour proved, to my dismay, just how precarious these abodes are by scouring most plants and support vegetation from their rocky perch.

The vast majority of *N*. "whiskers" will fit into a reasonably standard shape and colour pattern in this area. Some colonies are homogeneous, perhaps due to single seed genesis and vegetative expansion. It is mainly on these rock outcrops that a small fraction of plants have developed an adventurous streak. The labellums of some differ markedly from the norm, while still maintaining the "standard" colouration. **Fig. 2** Standard; The most common shape found in *N*. "whiskers". It is more or less diamond shaped with varying degrees of roundness to the apex of the labellum which can occasionally have a small apiculus. **Fig. 3** long; the labellum and lobes are elongated. This can give a long narrow opening to the interior. The lobes protrude further forward from the labellum disc. **Fig. 4** *N.* "Kaimai"-like; these have a longer more rounded appearance than the standard. The disc narrowing evenly to the apex sometimes has a small apiculus. **Fig. 5** circular; these labellums take an almost round form. The labellum disc is flat. It seems unreasonable to classify these as anything other than *N*. "whiskers" given that intermediate forms are to be found.

The situation becomes more complex (and interesting) when one considers the plants that have colouration outside the *N*. "whiskers" norm. Almost colourless translucent flowers occur in the darkest sites. In higher light the variation in colour and pattern increase noticeably. Perhaps this is due to the higher percentage of flowering plants increasing the potential for cross pollination and/ or a response to the light level. The difference in habitat may also promote change in some.

Green flowers similar in colour to *N. papa*, others indistinguishable from *N*. "Kaimai", and *N*. "Tinline" are to be found. **Fig. 6**: *N. dienemum*, *N. longipetalum* or *N.* "Pollok" hints of all three. **Fig. 7**; red or red/ black lobes are almost a feature of this long shape. **Fig. 8**; almost reverse *N.* "Pollok" are to be found that have a green strip down the centre of the labellum, the remainder of the flower crimson. These extremes "shade" back into the standard flowers with intermediate examples, see **Fig. 9**.


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There appear to be trends between labellum shape and colour, but to make matters worse some plants simply mix and match. As all these combinations lead to *N*. "whiskers" or diverge in differing directions, whichever way it is viewed, it becomes difficult, to say the least, to place any definite boundary between *N*. "whiskers" and other taxa. There are differences between the sites that may suggest an east to west drift. With the differences in labellum shape already seen in normally coloured plants are the other differences simply colour variations and these still essentially *N*. "whiskers", but only just? A *Nematoceras* "whiskers" capable of considerable genetic gymnastics! Alternatively are the long lobed plants in fact a precursor to, or reversion of *N.* "whiskers" and is it these interacting, or not, with *N*. "whiskers" that are generating these variations? There are many questions.

These variants have survived to a mature stage indicating potential to form colonies either sexually or vegetatively. That no colonies have been found as yet may indicate they are of recent origin, they may be sterile, the ecological niche is high risk or simply insufficient investigation has been carried out to date. With a number of variants living in close proximity to one another there must be a reasonably high potential for them to cross pollinate. At what point should one decide that a new species has been found?

Acknowledgement
Thanks must go to Eric Scanlen for providing me with information on the phylogenetic tree and photographs of North Island taxa. Also for informing this absolute amateur on how to format etc an article and putting forward a challenge to write something.

Pterostylis oddities

By Gordon Sylvester

On a recent foray into Arthurs Pass National Park at Kelly's Stream, it was noted the confusion that the genus *Pterostylis* appears to display. At one end of the Cockayne Nature walk *Pterostylis oliverii* is very prevalent, while at the other end of the same track less than a kilometer away there is a "confusion of species".

All show elements possibly of *P. irsoniana, P. australis, and P. oliverii.* The early flowers display an affinity to *P. cardiostigma*, which is not present in the area—or I should say has not been identified in the area. Another trait seen is the twisted labellum of *P. montana* agg.

Both ends of the track in question are about the same height above sealevel—about 360m. rising to about 380m in the middle of the track. There have not been any *Pterostylis* species noted in this elevated area of the track. Hopefully there will be further investigation next spring.

It is interesting to note some comments in the *Proceedings of the Royal Society* 1935; 64: 1-10 where RM Laing and HW Gourlay recorded the confusion of *Pterostylis* species in the Bealey river basin, later recording that "None of these species is typical of their representatives elsewhere. They occur in a great variety of forms impossible to classify satisfactorily. Intermediates between *P. oliverii, P. banksii and P. graminea* are all to be found".

It appears that nothing has been done since 1962. The only other record I have of any visits to the area are all by members of our Group. Bruce Irwin 1949, Brian Molloy 1998, and Eric Scanlen 2004 passed through on his South Island Odyssey.

What do we know? Historically….

Leonard Cockayne had a bach (crib) in the Kelly's Stream area and spent time there. The nature walk is named after him. It is not known if he carried out any investigations in this area.

RM Laing and WRB Oliver explored the Upper Bealey in 1929 and noted *P. areolata, P. oliverii,*

RM Laing and HW Gourlay explored the Bealey River in 1935 and noted *Pterostylis banksii, P. australis, and P. graminea.*

CJ Burrows explored the Waimakariri Basin in 1962 and noted in addition to Laing's records *P. irsoniana, P. mutica (tristis), P. venosa, P. cycnocephala (tanypoda).*

There are no public records of any other visits. Conversations with DoC staff at the Arthurs Pass field and visitor center indicate little or no knowledge of any of the orchid populations.

There is a lot of variation in floral characteristics, including leaves and method of display. *P. oliveri* and its intermediates display both erect and recumbent habit. Some flowers display the twisted labellum of *montana* and the rolled labellum of *irsoniana*. The galea is just as confused showing the *australis* trait, the *montana* trait as well as the *banksii* trait.

Leaves run the range of shapes from *montana* to *graminea* to *oliveri*: anywhere between 3 to 6 leaves overtopping or not dependent on the parentage.

A visit to the Taipo River, a tributary of the Taramakau River some three years ago revealed what I thought was an immature *P. cardiostigma*, because of its coloration and the habit of the sepals in the immature bud. When I went back to look at the plant it had been disturbed and uprooted on the roadside. I had put a query around the identification due to the location in deep forest on a damp road side and the month (October). I have not noted any other specimens in this location since. Reason suggests they are still present. Having seen the Kelly's stream site I am convinced this is so.

The questions now include, what are the strange *Pterostylis* species I had noted from the Mid Taramakau River flats, Callagans Water Race Track, Sandstone Road, Mahinapuna Forest, trackside Franz Josef Track as well as other sites intimated to me by others. All of them with a common trait; damp ground.

This leaves the question of whether the plants are naturally fertile or are extended by daughter bulbs.

1. What are the chromosome counts?
2. Are they primary or secondary hybrids?
3. What is the area of distribution of the plants?
4. Is there consistency in the population?
5. What is the primary stock and its distribution?

The New Zealand Native Orchid Journal

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Were the early botanists actually Gods?
or did they, like you and me, sometimes make mistakes?

by Bruce Irwin.

The first botanists who endeavoured to name and describe New Zealand's flora, worked under conditions which we now would regard as extremely difficult – even intolerable. They undertook a difficult task, made a splendid start, but didn't really finish it. How could they? Their explorations were restricted to scattered parts of the country and communications were so difficult that they virtually worked in isolation. Even so it is hard to understand why the *Pterostylis montana* complex, now so common, remained unknown until 1949 when Hatch described *P. montana* in *TRSNZ* 77. Surely plants of the *P. montana* complex must have been collected before 1949? They were. To my knowledge they appear in two North Island herbaria, where they are usually identified as *P. graminea*. But, you say, "*P. montana* is very different from *P. graminea*." So it is, but in those early days *P. graminea* itself was poorly understood. For almost 100 years, only two grassy-leaved *Pterostylis* were fully accepted in New Zealand – *P. banksii* and *P. graminea*. The status of a third taxon, *P. australis*, has always been doubted and generally it has been considered to be a variety of *P. banksii*. At that time (as now) the true identity of a species was difficult to establish. Even the author of a species would after a year or two, find it hard to recognise his "child". Type specimens were generally held in overseas herbaria, and popular, illustrated field guides were far in the future. On the other hand, JD Hooker in his *Handbook of the New Zealand flora*, had very "conveniently" included a statement that *P. graminea* was probably a small state of *P. banksii*. Consequently botanists can scarcely be blamed for concluding that only one grassy-leaved taxon existed: so opted to call it by its "alternative" name – "*P. graminea*" (the small form of *P. banksii*).

In November 1886, Edwin B. Dickson found what was almost certainly *P.* aff. *montana* at New Plymouth [J50:p.11, J52: p.31]. Dickson was probably unaware of Hooker's careless statement, but was clearly already possessed of some botanical knowledge, so realised that his plant was neither *P. banksii* nor *P. graminea*. A drawing and a draft description were forwarded to JD Hooker at Kew. Unfortunately Dickson apparently found no further flowers, so the plant remained nameless for another 83 years.

Strangely, two years before Dickson's find, F Müeller had described a plant from the Chatham Islands as *Pterostylis banksii* var. *silvicultrix*. Clearly it was not a variety of *P. banksii*, so recently was raised to specific status as *P. silvicultrix*. Its resemblance to *P.* aff. *montana* is undeniable, which perhaps explains why in J79, p.11, Angela Abernethy recorded from the Tuku Reserve on Chatham Island, *Pterostylis* aff. *montana,* together with *P. australis, P. banksii* and *P. venosa*, but very significantly made no mention of *P. silvicultrix*. Early in November 2007 I found plants, just beginning to flower, at Rangaiki Reserve on Chatham Island. All open flowers appeared to be *Pterostylis* aff. *montana*, though some in bud, when fully developed, would possibly show some of the range of variations noted among Ruapehu colonies. Other small plants may flower as *P. graminea*. A booklet published by the Wellington Conservancy of the Department of Conservation (about 2000), *Endemic plants of the Chatham Islands*, contains a photograph entitled *P. banksii* var. *silvicultrix* seemingly identical with the plants I had found and drawn. If this is so, it raises an interesting question: should some or all of the plants we regard as *P.* aff. *montana* on mainland New Zealand, be known henceforth as *Pterostylis silvicultrix*?

Left to right: *Pterostylis graminea, P. agathicola, P. montana, P.* aff. *montana*

How could such confusion arise?

Very easily it seems. Descriptions of the first few species within a genus were often brief and lacking in diagnostic information. They may have seemed adequate at the time, but when apparently new taxa came to hand and were compared with them, confident identifications proved impossible. Hooker's original description of *Pterostylis graminea* was described in *Flora II* as "short and unsatisfactory". Very possibly flowers of *P.* aff. *montana* had been compared with that description and because results were inconclusive, ended up in herbaria as *P. graminea*. That of course would set a precedent, so that future gatherings of *P.* aff. *montana*, would almost confidently be deemed to be *P. graminea*.

In J21 p.5, Lucy Moore published a very useful tabulation comparing *P. graminea* with the plant now named *P. agathicola* but at that time regarded as variety *rubricaulis* of *P. graminea*. This new grassy-leaved *Pterostylis* described in Cheeseman's 1925 edition of his *Manual of the New Zealand flora*, because of its only slightly larger flower was being misidentified with *P. graminea*.

In order to separate *P. graminea* from all other grassy-leaved *Pterostylis*, it is essential to have a clear understanding of that plant's diagnostic features. An important difference is that when the *P. graminea* flower is viewed from the side, the very few nerves on the dorsal sepal are widely spaced (particularly those close to the midrib) and that the white spaces between them are so free of greenish tints that the top of the column is sometimes faintly visible through them. These "windows" are further emphasised by the unusually dark green areas adjacent to them.

The pattern of nerves on *P. graminea* is quite distinct from that of *P. banksii* or any other grass-leaved *Pterostylis* and is confined to that species – or was – until *P. cernua* was described recently. I have not seen that new species but indications are that it is remarkably similar to *P. graminea* and seems to have the same nerve pattern on the dorsal sepal. Strangely, it is said to have affinities with the *P. montana* group. I venture to suggest that *P. cernua* is merely a form of *P. graminea*.

How strange that *P. montana* remained unknown for too long, whereas perhaps it would be preferable had *P. cernua* not been found at all.

Australian invaders take to the skies

By Mark Moorhouse

Is it reasonable to expect orchid seeds to spread by wind dispersal? Could Australian species possibly migrate across 1500 miles of ocean to start a new life in New Zealand using only wind to carry out this feat?

Lets examine a hypothetical scenario. This is necessary because it is literally impossible for science to calculate accurately the number of Australian sourced orchid seeds arriving in New Zealand. There are far too many variables. At best we can hope to prove that an airborne Trans-Tasman crossing is not only possible, but highly probable.

Consider some facts. Taking just one percent of the area of Tasmania, Victoria and New South Wales (those Australian States nearest and on a similar latitude to New Zealand) calculations show that just 0.1% of the orchids growing in this portion of Australia could conceivably produce 2 trillion seeds (using 500,000 seeds as an average capsule and 4 capsules as an average per plant and with plant distribution of only one plant per 100 sq m—see box).

The enormity of this figure raises an obvious question. Why do temperate orchids, in fact most orchids, produce so many seeds? Seeds so light that a manual shake of a ripe picked capsule, launches brown clouds of seeds floating about for a considerable time even on a virtually calm day.

It has been argued that so many seeds are set per capsule because so few flowers are pollinated and this is the way the plant compensates for this.

Dr Calaway Dodson [1] stated "In an acre of forest, there may be roughly 1,000 plants of *Oncidium*, and each plant may have 100 small flowers on it. Yet of these thousands of flowers, rarely do we find more than five seed capsules produced. This tells us pollination is a rare occurrence, yet since one seed capsule contains thousands of seeds, this is enough to keep the population going." He goes on to say " Some *Cattleya* capsules produce 30,000 seeds. In nature they would ride the wind."

Darwin [1] also pondered the enormity of orchid seed production. He counted the seed in a small European orchid and discovered that 6,200 seeds formed in each of the 30 or so capsules. He then calculated that if every seed grew, the offspring would cover the entire land mass of the earth in just three generations. He was mystified at what limited such rampant reproduction.

Interestingly this highlights two facts:

1. Even relatively large seed, like *Cattleya* are capable of becoming windborne.
2. Temperate orchids produce seed far more prolifically, but few grow. Just how few is a critical factor in producing a mathematical hypothesis.

- 1% of NSW, Victoria and Tasmania = 10,958 sq kms of orchid habitat
- at a given distribution of 1/100 sq m = 109,580,000 plants
- capsule average per plant for all species = 4
- seed count average per capsule = 500,000
- average seed count per plant = 2,000,000
- Seeds from109,580,000 plants = 219,160,000,000,000

A brief study of New Zealand orchids highlights that *Pterostylis, Chiloglottis* and *Thelymitra* spp have relatively high strike rates. This is evidenced by the fact that we can often find them growing in sizeable clumps containing two or more generations. Other spp such as *Nematoceras* also form clumps, but do so vegetatively. Most species of this family also extend the peduncle after pollination takes place to enhance seed distribution. How effective is this? Take a walk through a Nelson forest and note the distance between colonies of *Nematoceras*. You may walk some 30 m or several hundred metres between colonies. How does seed travel from its mother capsule across several hundred metres of open bush to begin a new colony? The mother plant's adaptation relies on swirling wind currents, and this proves that some seeds do disperse successfully far further than the 10 m as suggested by the Korean experiment cited in *Journal* 108 [2]. Wind tunnel experiments strive for constant wind-flows. This in no way imitates the swirling broken air-flow of wind passing through forest or scrub. If the number of seed passing the 10m mark from the mother plant were just one 10,000th of a percent, and remember, our hypothetical scenario has 219 trillion seeds to begin with, that means a very large number of seeds still become airborne for significant distances.

Once launched, how do they remain airborne? Thermals form about most sloping hillsides. These up-draughts can launch birds and fine airborne material to great heights. In our part of the globe the dominant wind is a westerly, so any Australian orchid seed picked up by thermals will gradually drift in an easterly direction towards New Zealand. Many weather patterns cross the Tasman in less than 36 hours. Some seed could even reach jetstream height and fast track the crossing of the Tasman sea. Whirlwinds could also play a significant part in launching seed into the air. It would only take a willy-willy to pass over a patch of dehiscing orchids to elevate hundreds of millions of seeds skywards in seconds. In addition birds, bats and flying insects may be agents in getting seed airborne.

Why don't they just keep on flying right past New Zealand? As the warm moisture-laden airflow approaches our coastal hills it is forced upwards and any minute particles of dust including our orchid seeds suddenly find themselves encapsulated in a droplet of water. Dust particles and our orchid seeds actually enucleate raindrops. Our beleaguered seeds are revitalized, and as the seed falls to earth within a raindrop, it finds a nice damp medium in which to start life.

But most of them would simply miss New Zealand. While it is definitely true that some would pass to the north, if you draw a line from Cape Reinga through Gympie in Queensland, any orchid south of that line could disperse seed to New Zealand. This is based on the dispersal pattern of volcanic ash from eruptions in westerly belts. A simple example you can look at on a map. The eruption of Lake Taupo in AD 186 put a 2cm layer of ash on the Chatham Islands. Extrapolate a line westwards passing through Chathams and Taupo and you will see the possibility of seed also arriving from Queensland.

In summary, if just a staggering one billionth of one percent of the seed produced in one percent of the south eastern states of Australia arrived in New Zealand, then 20,000 plus seeds arrive here a few days after each decent windstorm in Australia. A few grow. What species are most likely? Those species that strike most easily in their natural habitat, ie, are less fussy about where they grow, seem prime candidates. Have we discovered Australian *Chiloglottis, Thelymitra* or *Pterostylis* here in New Zealand? The evidence published in this journal speaks for itself.

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The Type Locality

4. The Seventy Mile Bush and *Microtis longifolia*

By Ian St George

In 1885 William Colenso described *Microtis longifolia* [1]. The chief difference between this and *M. unifolia*, he claimed, was the late flowering season (February and March – Forster had found *M. unifolia* in September on Long Island, Queen Charlotte Sound) along with "several (other) characters" for which the reader was referred to his not entirely helpful description.

In 1906 Thomas Cheeseman included all the previously described *Microtis* in New Zealand in *Microtis porrifolia*, including Colenso's *M. longifolia*. He commented, "There appear to be differences in the shape and size of the calli on the lip, the shape of its extremity, and the extent to which the margin is crisped." [2] Subsequent authors have taken a similar stance, including *M. longifolia* as a synonym of *M. unifolia.*

Colenso's description

***Microtis longifolia*, sp. nov**.

Plant variable in size, and in the number of its flowers; tall, erect, 1 foot 3 inches to 2 feet 3 inches high; leaf solitary terete tubular, with 3 longitudinal furrows from base to tip, 2–3 inches longer than scape, and on open oppressed bract at base 1–2 inches long. Scape stout, 2–3 lines diameter, cylindrical below sub-angular above; raceme 3–6 inches long, many flowered (25–40), flowers pedicelled, small, distant, 2–6 lines apart; bracts 2 lines long, broadly ovate-acuminate, transversely rugulose and decurrent; upper sepal boat-shaped, sub-cucullate, acute; lower pair largely divergent sub-revolute, obtuse; petals free, recurved, obtuse; lip oblong, laciniate or sub-lobed, much crisped at margins; tip broad and bifid; the two lumps at base very large, dark green, smooth and shining; the lump near tip tuberculate or crisped, commonly in two ridges; ovarium stout, 3 lines long, finely papillose, flat beneath, very turgid and gibbous above.
Hab. Skirts of woods near Norsewood, County of Waipawa; flowering in February and March; 1883–84: *W.C.*
Obs. A species allied to the common *M. porrifolia*, but differing in several characters (*vide descript. supra*); and also from its flowering in the autumn. It is nearly allied to some of the Australian species.

The type specimen is in WELT (24277), collected at "Norsewood".

The Seventy Mile Bush

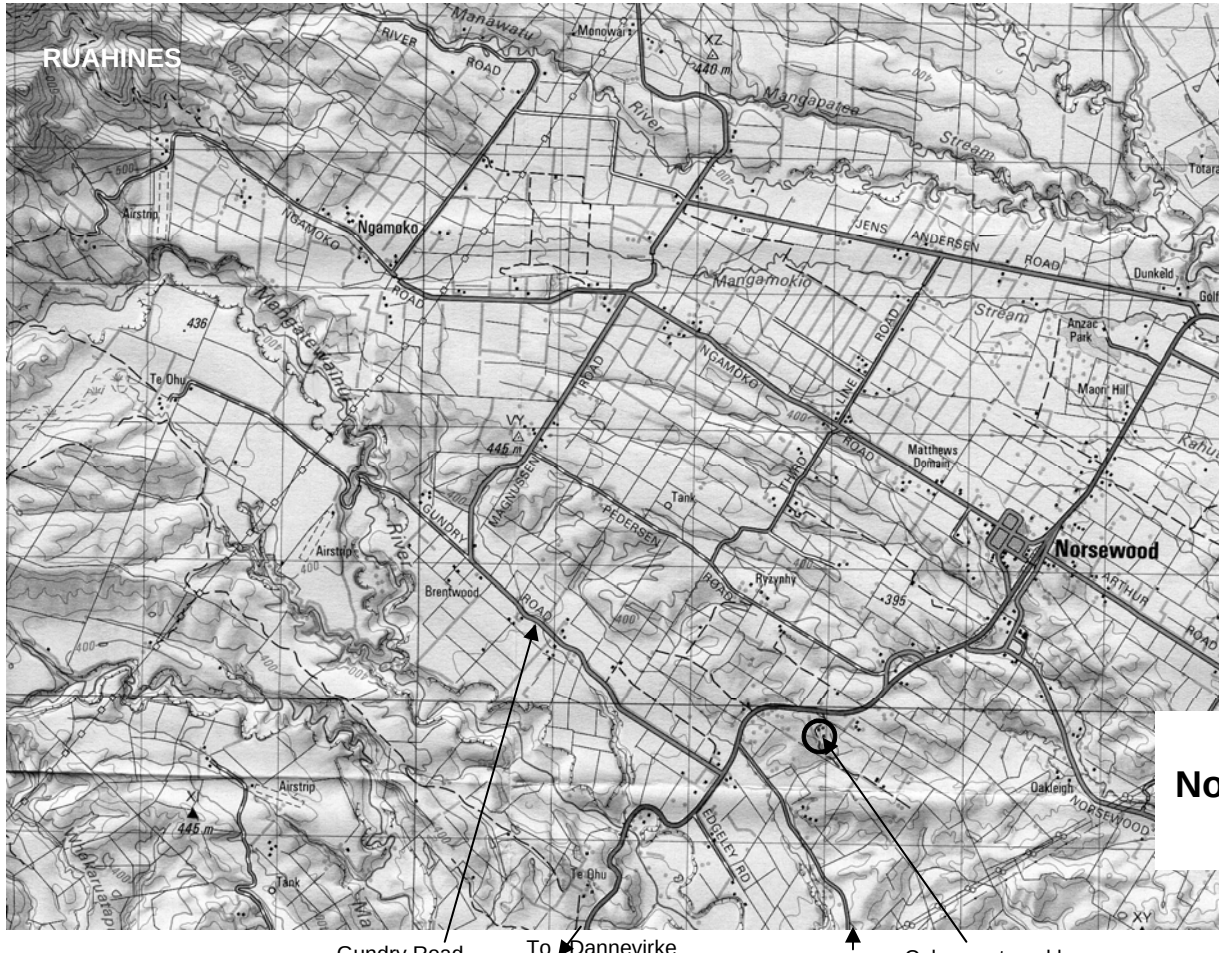
The great forest stretching from Masterton to Norsewood was called the Seventy Mile Bush (or often the Forty Mile Bush – or just the "Bush"). "The Māori name for the forest is *Te Tapere Nui o Whatonga*. This forest was a huge green cloak with many species of trees including towering rimu, totara, northern rata as well as many ferns, shrubs, climbers and herbs, all living under the mantle of Tane-Atua of the forest. The forest was alive with the sounds of the many different species of birds with beautiful songs such as the huia, kokako, saddleback and piopio. Falcon ruled the sky, kokako sped along the branches of the tall trees, while kaka screeched and the kakapo boomed in the night, along with the chuckle of the laughing owl. The call of the kiwi could be heard for many miles through the darkness of the night. Bats flew through the forests, while the moa, takahe and wren lived on the ground with the kiwi." [3]

We mourn fashionably, in this conservationist time late in our national development, the destruction of the bush, but we should understand the position of the early settlers, for whom clearing the land was essential for survival.

The Norsewood families were recruited in Norway, and their hopes were high as the men travelled by drays from Napier: "… exquisite… the starry clematis, more beautiful than the weeping rimu, more delicate than the ponga or the majestic mamaku. But… the hopes of the immigrants (were) on the satisfaction of the longing for land to till. For many of the men disillusionment and despair replaced the highest hopes when they saw the land which they were to settle. Fertile, perhaps; who knew? But lost beneath a dense entanglement of shrubs and vines growing beneath the giant trees of the forest…. To the women the shock was even more severe. Some wept when they saw the forest, others became hysterical. As they lay, sheltered only by fallen trees, or by the foliage of shrubs… some of them must have glimpsed the solitude ahead of them, their relation to the forest, inescapable always, in whose shadows the lives of most of them were to be spent, until at last it killed them, crushed beneath the boughs of its trees, or denied access to medical aid when they lay ill, or until, in its last diabolical act of self destruction, its flames consumed the patient savings of years." [4] (The last reference is to the terrible fires of 1885 that destroyed many Norsewood buildings, property – and records).

Colenso wrote the earliest surviving record of "Norsewood" in his role as school inspector in 1874, the year a coach service between Napier and Palmerston North began (the railway reached Kopua in 1877): "There is… a small school at a new place, or Scandinavian settlement inland, called Dannevriik, for which a teacher is required…. The place is

The Norsewood Lutheran church built in 1882 by "Carpenter" Olsen, destroyed in the 1888 fire.
Photograph reproduced courtesy of the Napier Museum and Art Gallery.



Around Norsewood today

very secluded in the woods. There is another small settlement of Scandinavians at Norsewood, a few miles off…." Colenso admonished the teacher for closing the school and giving a holiday every time there was a funeral in the district. (The teacher also closed the school for baptisms and bushfires, for the reason that he had to officiate at baptisms and funerals as well as teach English to the Scandinavian children). [4].

Colenso was "with mixed feelings to watch the newcomers' hopes and necessity push back the stump-charred forest margin towards the Ruahine foothills, reducing to thin clumps of cattle-trodden gullied copses the landscape that was Te Tapere Nui a Whatonga." [5]

The forest burned: "… the sun could only ogle through a pall of smoke that veiled the burning dissipation of a costless heritage. The narrow road… would be a choking pit of smoke flanked by burning forest. Then the equinoctial gales would sweep through the gaunt, exposed, still erect victims of the blaze, making all bush travel unsafe from their threat and the road impassable until gangs had cleared it." [5 p431] The fires spelt the end of the huia, of course.

Colenso stayed with friends at a house called "Fernhill" (it was the first house on the right going north past the junction of Garfield Rd and SH2, a kilometre south of Norsewood; it was destroyed in the fires and the present house, called "Fernhills", was built in 1907. A plaque recalls its early settlers). Michael Stone, Dannevirke teacher and historian, has a 2002 recording of 99 year old Bela Andersen who recalled her father and sister talking about dinners when Colenso was a guest.

Colenso wrote lovingly of the Bush, "I am leaving today for 40 Mile Bush—to spend a few days in the sublime forests" [6]; "I purpose leaving for the Bush (my Highland Home)" [7]. "I have been thinking of paying a visit to Fernhill for a few days" [8].

He described many new plants from the Norsewood area, among them the orchids *Caladenia variegata, Corysanthes hypogaea, Dendrobium lessonii, Earina alba, E. quadrilobata, Gastrodia leucopetala, Microtis longifolia, Pterostylis patens, Sarcochilus breviscapa, Thelymitra nemoralis* and *T. purpureofusca*.

It was this outpouring of new descriptions from Hawkes Bay that exasperated Cheeseman, who wrote, "I am sorry that I find it impossible to accept as distinct species most of the plants you have described…", to which Colenso famously replied, "Of one thing I am pretty certain, that if you *knew* these plants I have laboured to describe, you would, I think, alter your judgement concerning, at least, some of them…. Continue to make what remarks you please on my work – it shan't break squares between us: only, don't use a rusty lancet." [9].

Nicely put: don't descend to *argumentum ad hominem*; debate my arguments all you like, but don't attack me personally. Too many would be scientists forget that.

What is at the skirts of the woods now?

An 1889 map in the Alexander Turnbull Library shows Gundry road and Ngamoko road leading towards the Ruahine foothills, Gundry from a little west of Fernhill, and Ngamoko from Norsewood township to the Siberia sawmill.

Colenso would have walked one of these to the forest edge ("I arrived there {the Bush} on the 21st at noon, went into the woods {2 miles off} that afternoon") [10].

We drove to Gundry road late February, and searched for *Microtis*, but found not one.

Then quite coincidentally Mike Lusk emailed with a photograh of a *Microtis* he had found on Kuripapango Hill on the other side of the Ruahines. He wrote (2 March 08), "I took the attached pic (next page) of a *Microtis* at the southern end of the Kaweka range last weekend. I wondered if it might be a very late flowering M. arenaria mainly because of the notch in the labellum and because it is listed as occuring in Hawke's Bay…". Well, and isn't that a very long leaf.

The next week Mike sent specimens to Brian Molloy, who identified the plant as typical *M. unifolia.*

Above: Fernhills, on the site where Colenso stayed on visits to Norsewood.
Below: the plaque at Fernhills; Bela (Elizabeth) Andersen recalled her father and sister reminiscing about dinner with Colenso.

Conclusion

Microtis longifolia Col. looks like *M. unifolia*, but it flowers 5-6 months later.

In my experience *M. unifolia* starts to flower in September and is well over by December. *M. longifolia* Col. flowers in February and March.

This behaviour is well known in the British *Orchis ustulata*, which flowers in the third week of May, and then at different sites in late July and August, well after flowers at the first sites have shrivelled and died. David Lang thinks the orchid is separating into two species, though continental European observers believe they can see sufficient structural differences to split them into two species now. [11]

Are *Microtis unifolia* and *M. longifolia* different species with similar structure, flowering at different times? Perhaps so. Or perhaps they really are both *M. unifolia.*

Somehow I suspect we have not heard the last of *M. longifolia* Colenso.

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2. Cheeseman TF. *Manual of the New Zealand Flora.* 1st edition. Wellington, Government Printer, 1906.
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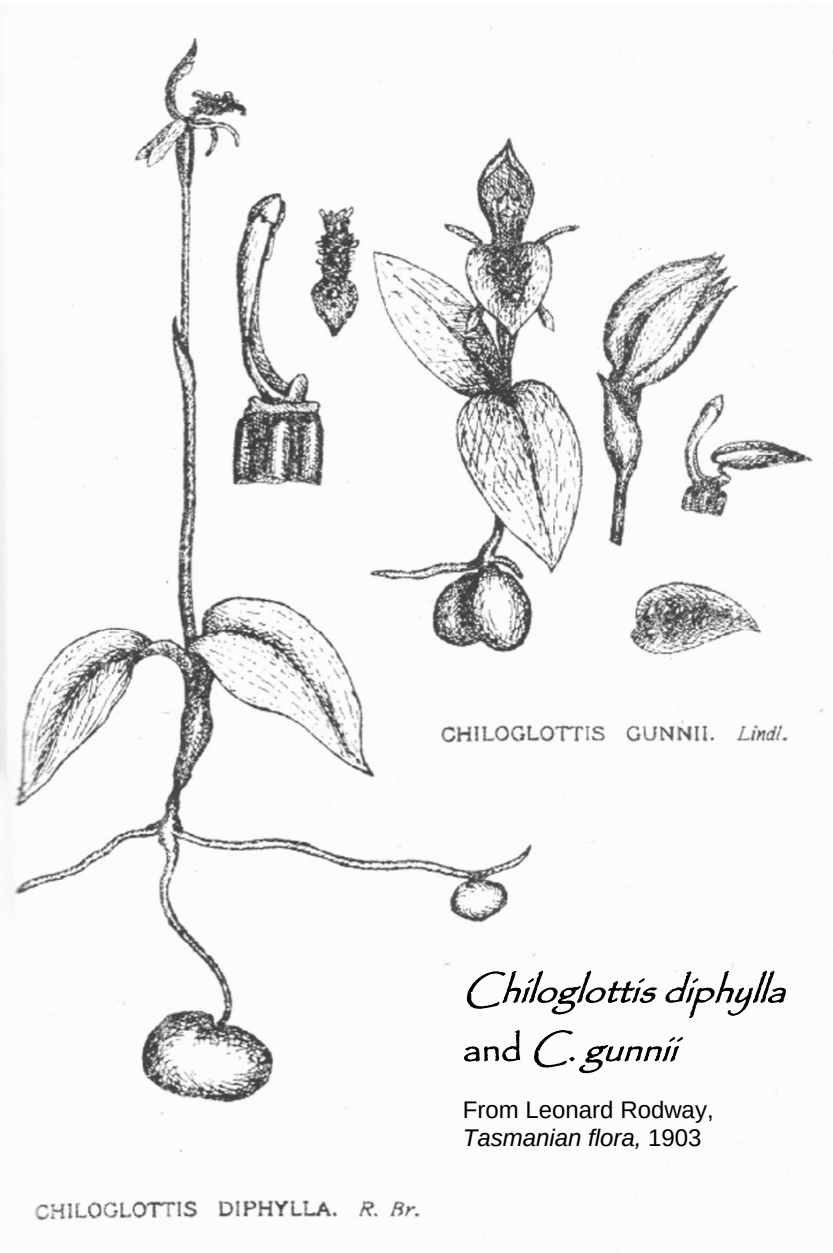
Close relations: orchids like ours



Chiloglottis diphylla and *C. gunnii*

From Leonard Rodway, *Tasmanian flora,* 1903

Elementary: ED Hatch

18. Miscellaneous terrestrials 7.

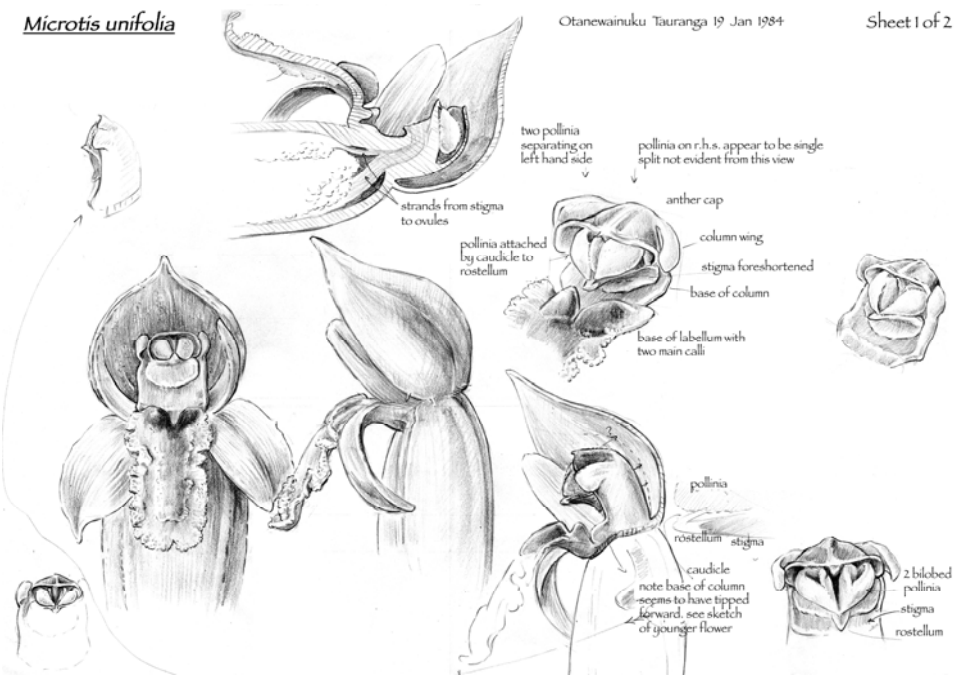
with drawings from *Bruce Irwin's drawings of New Zealand orchids.*

Microtis

(little ear – the auricles at the side of the column)
This is a difficult genus for amateurs, since the specific differences are literally microscopic. 5 species are recorded for NZ, but I will only mention 2 of them.
Small green plants with small green flowers. The leaf is hollow, *cf Corunastylis*, and the various species look very much alike. While most of them are plants of bogs and stream edges, *M.unifolia* can grow almost anywhere.

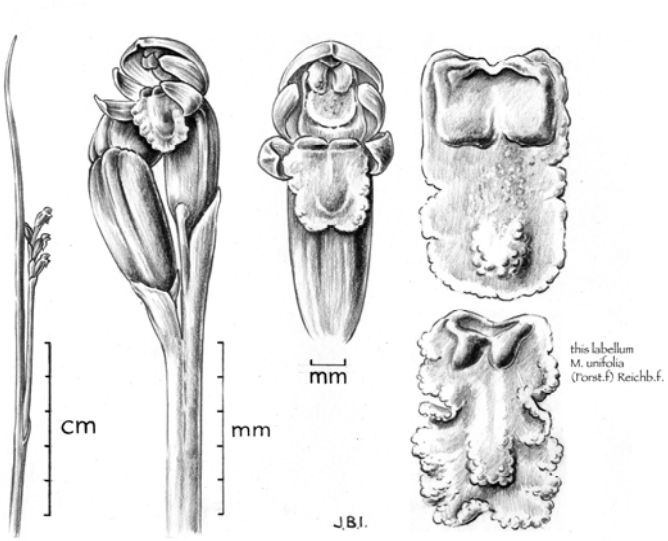
20: *Microtis unifolia*

(single leaf – they all have!)
Distribution – ± common throughout Australia and northward into Asia.
New Zealand – Three Kings Is., Great and Little Barrier Is., North, South, Stewart and Chatham Is.
Flowers – October-January – insect and/or self pollinated.



21: *Microtis oligantha*

(the few-flowered spike)
Up to 4, loosely arranged flowers on conspicuously slender pedicels, dorsal sepal rotund, obtuse.
Distribution – endemic – North Id., from Mount Tarawera southwards: South Id., Chatham Is.
Flowers – December-February – self pollinated.

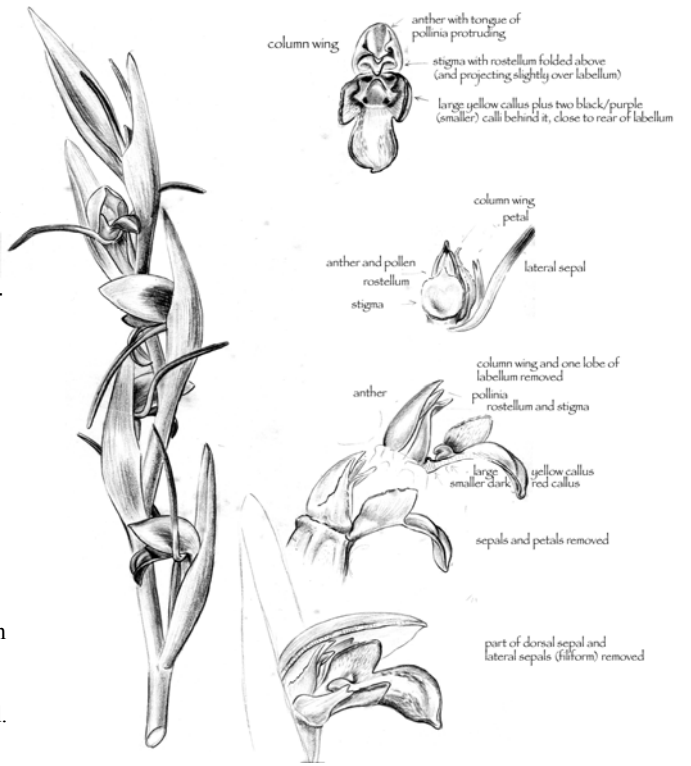


Orthoceras

(straight horn – the lateral sepals)
At present 2 species, 1 *O.strictum*, in Australia and 1 in NZ.

22: *Orthoceras novae-zeelandiae*

(of New Zealand)
A plant of open spaces, gum-clay, scoria etc. with a rosette of linear leaves. Flowers several, varying from dark green, through pale green to yellow, the semi-erect lateral sepals most conspicuous.
Distribution – endemic – North Id., throughout. South Id., Sounds/Nelson district.
Flowers – December-February – insect pollinated.



Eponymous orchids: Val Smith

Harry Carse (1857-1930)
Anzybas carsei

William and Rebecca Carse (née McIntosh) were of Scottish descent; their son Harry was born in the small town of Leek, in Staffordshire, England. After receiving most of his education at Musselburgh near Edinburgh, Harry Carse worked in banking until 1885, when he emigrated to New Zealand. In Auckland, at the age of 28, he married Margaret Philip with whom he had a family of five – three daughters and two sons.

During his first years in New Zealand Carse took whatever work was available. However, when he became better known he was offered teaching positions in the Auckland area, and in 1893 was appointed to the Kaitaia School where he met Richard Henry Matthews, a foundation member of the school committee. They had a mutual interest in native plants, became friends – and pursued their botanical interests in earnest! In 1896 Matthews wrote the first of many letters to Cheeseman with reports of their finds, observations and specimens for identification. From his next teaching posts at Maungatapere, and Mauku in South Auckland, Carse corresponded with Cheeseman, and also Petrie, while keeping in contact with Matthews and spending summer holidays collecting with him. Then, in 1902, Carse gave up teaching to go dairy farming.

He bought land at Kaiaka near Kaitaia and continued his botanical projects, working closely with Matthews. Four years later he was appointed teacher at the nearby Fairburn School – close enough to not interfere with milking! After Richard Henry Mathews died in 1912, his son Blen became Carse's closest friend and botanical companion. Carse wrote the last of over 100 letters to Cheeseman from Kaiaka. In 1921 he and his wife retired to Auckland where the young botanists Lucy Moore and Lucy Cranwell, who often visited, noted that his herbarium seemed to occupy half of his small home. He kept collecting as long as he could, and died on 25 November 1930.

Harry Carse was described as a gentleman with a kindly and genial nature and a readiness to help others. Largely self-taught, his main work was with the ferns and sedges; his most important publication, *On the Flora of the Mangonui County* (1911). Another major contribution to New Zealand botany was the encouragement he gave Amy Hodgson to pursue the study of liverworts, in which she became the New Zealand authority. Among the seven or so plants named in his honour, was the orchid *Corysanthes carsei (now Anzybas carsei)* that he and Harry Blencowe Matthews relocated in 1912, two years after Blen's original discovery.

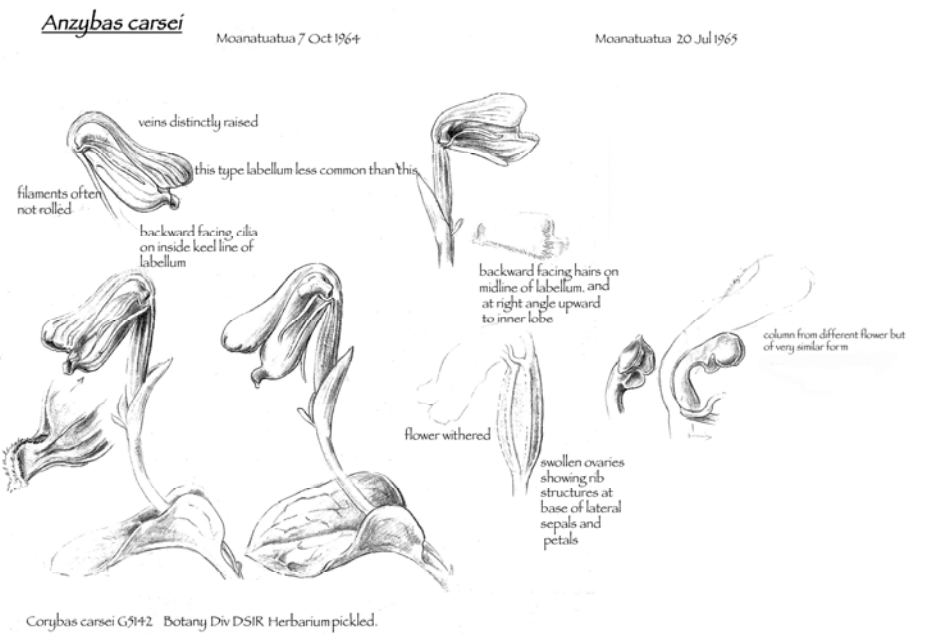
Anzybas carsei

Helmet orchid (orchid family – Orchidaceae)

Drawings by Bruce Irwin, from *Bruce Irwin's drawings of New Zealand orchids.*

Anzybas: a new genus (2002) of six species endemic to Australia and New Zealand, the name a derivation of *Australia/New Zealand* and *Corybas*, the genus from which they were split; *carsei*: after its co-discoverer Harry Carse, who made a major contribution to the botanical knowledge of the far north.

This is New Zealand's rarest endemic orchid, now known from only one spot in an *Empodisma* bog in the lower Waikato, where it flowers in September. *Anzybas carsei* has a single small green heart-shaped leaf, and a comparatively large reddish-purple flower; the lateral sepals and petals are shorter that the labellum, and the tip of the dorsal sepal is deeply cleft. The species has long gone from where it was first found – the draining of Lake Tangonge and subsequent drying out of the bog, plus over-zealous collecting, would have left it little chance of survival.



Notes etc

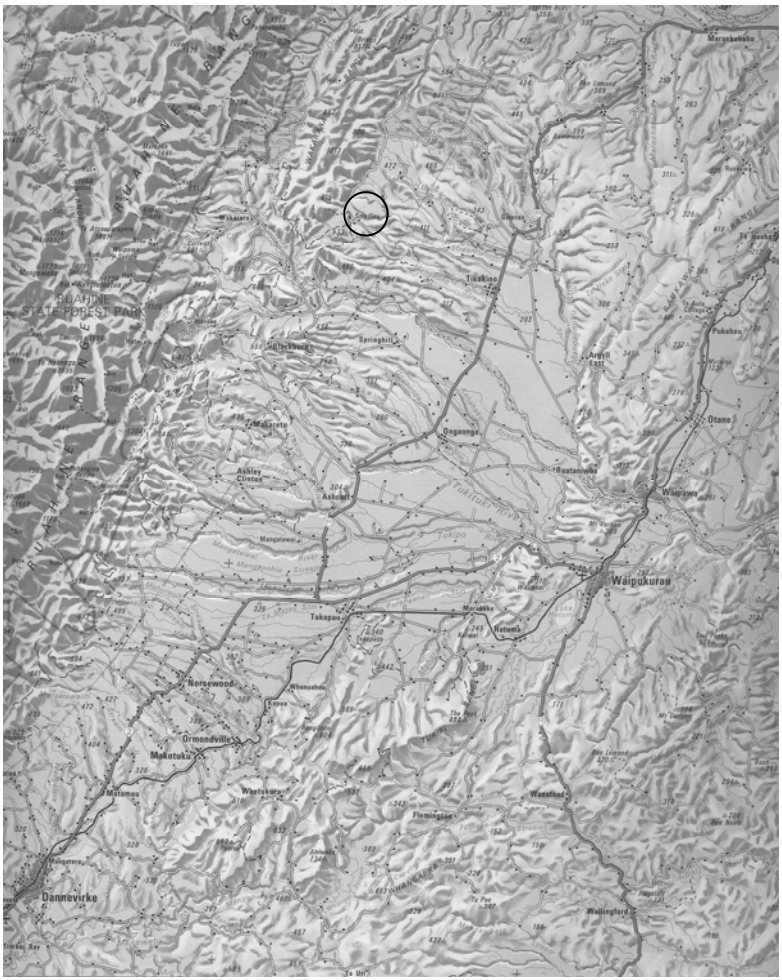
Mike Lusk saw **Caladenias in Boundary Stream reserve** on Jan 8, and another from Kuripapango Hill in the Southern Kawekas on Feb 22 at 1350m. Very late, as he pointed out, and rather unusual, as Eric Scanlen pointed out (**Figs 10, 11**).

Now here's an interesting paper by Anne Gaskett and her colleagues in Australia: ABSTRACT: **Sexually deceptive orchids** lure pollinators by mimicking female insects. Male insects fooled into gripping or copulating with orchids unwittingly transfer the pollinia. The effect of deception on pollinators has been considered negligible, but we show that pollinators may suffer considerable costs. Insects pollinating Australian tongue orchids (*Cryptostylis* species) frequently ejaculate and waste copious sperm. The costs of sperm wastage could select for pollinator avoidance of orchids, thereby driving and maintaining sexual deception via antagonistic coevolution or an arms race between pollinator learning and escalating orchid mimicry. However, we also show that orchid species provoking such extreme pollinator behavior have the highest pollination success. How can deception persist, given the costs to pollinators? Sexually-deceptive-orchid pollinators are almost exclusively solitary and haplodiploid species. Therefore, female insects deprived of matings by orchid deception could still produce male offspring, which may even enhance orchid pollination. [A. C. Gaskett, C. G. Winnick, M. E. Herberstein (2008) Orchid Sexual Deceit Provokes Ejaculation. The American Naturalist 171: 6, E206-E212. http://www.journals.uchicago.edu/doi/abs/10.1086/587532].

Go to http://www.anbg.gov.au/cpbr/cd-keys/orchidkey/html/AustralianOrchidNameIndex.pdf for the **new Australian orchid names.**

The June issue of *The Orchadian* has a paper by David Jones, in which he gives notice of his imminent new book on the orchids of the ACT, for which he describes twelve new orchids in this paper—including a new *Stegastyla (S. moschata), Calochilus platychilus, Corunastylis cornuta, Spiranthes alticola,* and others in genera unrepresented in New Zealand. Of the *Spiranthes*, he says that *S. australis* is no longer considered a single entity, but contains at least 3 taxa, one of which is the new species—with a flaring (rather than tubular) labellum (Jones DL, 2008. **Twelve new species of Orchidaceae from south-eastern Australia**. The Orchadian; 15 (12): 546-558). In a second paper (*ibid*, 559-561) he and Dean T Rouse describe two new species of *Prasophyllum* from the ACT.

Oops! Editors err. This editor takes the view that to do so is human, and the best action is to confess and correct the errors at the next opportunity. But just occasionally the gaffe is so bad that an apology is warranted. Eric Scanlen carefully proofread **J108**, but somwhow I sent an earlier version to the printer, with the result that many of Eric's corrections were missing from the final copy. My apologies to Eric, and to readers: please note the following: on p22, the caption for Fig 12 should begin, "The Fig. 18 flower…" not Fig 17; the caption for Fig 15 should refer to Fig. 22 not Fig. G; in the caption for Fig 19, the orchid was *Thelymitra* "sky" *alba*, not *T.* aff. *longifolia* "stunted"; the first Fig. 22 should read Fig. 21; on p30, replace "Fig. D" with "Fig. 17" (2 places, column 1) and replace "Fig. G" with "Fig. 15" (2 places, column 2); on p31, replace "Fig. H" with "Fig. 22" (2 places, column 1) and replace "Fig. Q" with "Fig. 20" (1 place, column 2); on p34 replace "Fig. W" with "Fig 24" (1 place, column 1); the "mayfly" was a "crane fly" top of column 2 and the last reference, Dawson et al was 1998 not 1988.



Come to Colenso country 5-7 Dec

In the country on the chart at left Colenso and his cobbers collected orchids which he went on to call *Bulbophyllum ichthyostomum, Caladenia macrophylla, C. variegata, Corysanthes hypogaea, C. papillosa, Dendrobium lessonii, Earina alba, E. quadrilobata, Gastrodia leucopetala, Microtis longifolia, Pterostylis emarginata, P. patens, P. subsimilis, P. trifolia, P. tristis, P. venosa, Sarcochilus breviscapa, Thelymitra cornuta, T. nemoralis, T. purpureofusca, T. formosa.*

Few regions can have been the subject of such intense early scrutiny, nor the identity of the orchids the subject of such intense debate.

Camp Wakarara (circled on the map above) is easily capable of accommodating 20. There is a large dining area with fully appointed kitchen attached, showers and toilets and various bunkrooms close by. There is also a substantial BBQ setup (woodburning), and plenty of outdoor tables (http://www.campwakarara. org.nz/). Full catering is available and cheap. There are 2 easy low-level walks, one to Middle Stream and the other Yeomans Track, and several which, while easy in tramping terms, do require gaining height, Mike Lusk tells us.

Email Ian St George if you are interested: istge@rnzcgp.org.nz.

Deadline 20 August.

Kevin Matthews sent a reprint of a paper describing colonisation of pine stumps by the fungus Armillaria [1]. The paper noted, "Rhizomes of the native orchid *Gastrodia cunninghamii* were found associated with some stumps, and are common in Kaingaroa Forest, sometimes in large quantities, among roots of pines infected by *A. novae-zelandiae*. *Armillaria* rhizomorphs occasionally ramify across the surface of orchid rhizomes (personal observation), but mycorrhizal infection as reported in *Nothofagus* forest in the South Island (Campbell, 1962) has not been confirmed. It therefore remains to be determined if the distribution of the orchid in pine stands is related to the occurrence of *A. novae-zelandiae*." The late Ella Campbell had found the **mycorrhiza of *Gastrodia unninghamii*** to be *Armillaria mellea* [2]. Kevin pointed out that the two species *A. novae-zelandiae* and *A. limonea* were collectively called *Armillaria mellea* in old records. He sent the beautiful photograph of *Armillaria limonea sym Armillaria mellea* shown in **Fig.1, inside front cover.**

1. Hood IA, Gardner JF. Colonisation of *Pinus radiata* thinning stumps by *Armillaria* and other Basidiomycetes following treatment with *Armillaria* basidiospores. 2008. New Zealand Forest Research Institute, Rotorua.
2. Campbell EO, 1962. The mycorrhiza of *Gastrodia cunninghamii* Hook. f. Transactions of the Royal Society of New Zealand, Botany 1: 289-296.

Kevin Matthews sent the photograph of 70+ flowers on a tuft of ***Adelopetalum tuberculatum,*** from near West Foley's Bush, Northland, taken 1 June 2008 (**Fig.12**).

Eric Scanlen wrote, "AD Mead lists *Corybas unguiculatus* (***Anzybas rotundifolius*) in the Waitakeres** in his 1972 second edition of *Native flora of the Waitakere range, Auckland*. I came across it whilst hunting for something else. Peter de Lange also told me that there were specimens of it in AK from the Waitakeres: I guess Arthur Mead would have deposited the specimens. Thus there is tangible evidence that it once resided further south than Warkworth. Arthur was Waterworks Engineer for the Auckland City Council when the Waitakeres were the sole source of water for Auckland. He was also a dedicated conservationist so he knew the catchment areas inside out."

Eric Scanlen noticed that eastern Victoria had both *Thelymitra decora* and *T. pulchella*. But how did our endemic orchids* go against the prevailing wind to Victoria? Kevin Matthews said birds, insects – including butterflies (J108:**2**,4) – were suitable carriers. Kevin showed evidence that dotterels from lower South Island migrate to coastal Victoria during Dec-March, just when the orchids would be dehiscing.

But hold on: both those *Thelymitra* from Victoria have recently been reclassified. Their *T. decora* is now *T. simulata* and has only 2n=52 chromosomes (our *T. nervosa/decora* has 2n=54). Furthermore the Aussie *T. pulchella,* (which is a dead ringer for one of the many forms of the NZ *T. pulchella*), has also been reclassified as *T. erosa*, said to be uncommon and only in the subalpine zone so there is the problem of how the dotterels, frequenting coastal Victoria, ever got the seed up there.

There now being no NZ endemic orchids naturally occurring in Australia, Eric has returned to championing the jet-stream theory for orchid seed transport – because the jet stream moves only eastwards as do the orchid seeds. Butterflies and other insects still hover as possibilities because they probably only move eastwards, like the orchid seed, with the prevailing wind. But could the seed survive the 50-60 hours' transit time in the desiccating warmth at sea level? For that matter, could orchid seed survive in the extreme cold of the jet-stream at ±10km up?

Volunteers please, to fly up and sieve the jet-stream for orchid seed.

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* Neither *Thelymitra decora* nor *T. pulchella* could have originated in Australia because they are amphidiploid hybrids with NZ endemic *Thelymitra longifolia* as one parent. So progeny of *T. longifolia* (*T. decora* and *T. pulchella*) could not arise in

Australian notes: David McConachie

Victorian High Country - January 2008

By Colin Rowan, reprinted from ANOS (Vic) Bulletin 40:8 p11-12 March 2008.

The starting point for our high country adventure was the Native Dog Camping Ground. This site is some seven hours drive from Melbourne central, and so it was with some excitement that we all gathered round on day one to start our search for orchids.

The first stop was a large open meadow where we knew we would find *Corunastylis arrecta*. Dick Thomson, our leader for the weekend, had investigated the area the day before and tagged the orchids for us. They are so small and blend so well with the surrounding plants that it's hard to spot them. Nearby we found some great examples of *Theymitra cyanea*, fully open. Yes, it was a nice, hot and quite humid morning, perfect conditions for the thely's. Shortly after, we discovered in the surrounding forest some *Pterostylis atrans* and *P. decurva* and plants with intermediate looks. Moving on, we found two plants of the rare *Thelymitra alpina* in flower, a special treat for everyone, especially the photographers amongst us.

Our next stop was the side of the road where, on our last trip, we found *Archnorchis aestiva*, the mountain summer spider orchid. Even with all the eyes we had available to search, no spiders were found, although some fine examples of *Microtis* species were duly noted.

Lunch was a leisurely affair under a large spreading gum at another meadow. Here we found more *Corunastylis arrecta* as well as *C. despectans* plus more *Thelymitra cyanea*, *Pterostylis atrans* and *P. decuva*. New orchids for this area were *P. alpina*, *Prasophyllum sphacelatum* (Large Alpine Leek) and *Diuris monticola*.

After dinner, all attending sat around in a circle and discussed the day's events and orchids in general. It was revealed that one member had an accident close by the camp. The trailer he was pulling had a blow out which swung his car into the gutter and, as he corrected, the car took flight and crashed down a three metre embankment. The car looked great from the top, but it was probably a write-off. Thankfully our member climbed out unharmed! A couple of members were stung by what were probably jumper ants (*Myrmecia pilosula*), one member having a very acute allergic reaction. Fortunately both members survived, thanks to those who supplied some antihistamines.

Sunday arrived with more good orchid hunting weather, and we all packed into the available 4WD's as the next location was along a very rough track. At our destination, we soon found some *Hymenochilus* sp. aff. *cycnocephalus* (Alpine Swan Greenhood). Following a small watercourse through the meadow, we came across the rare *Prasophyllum niphopedium*, first in bud then some plants in full flower. These plants were believed to be a new colony and not previously recorded.

As we moved away, we were confronted by a brumby stallion and his mob of about eight horses. After all, we were in his territory and he wanted us to move on. These brumbies are doing a lot of damage to the alpine meadows and sphagnum bogs, with the help of wild pigs and deer. Unfortunately not enough, it seems, is being done to control the problem.

Lunch was under another large spreading gum before we headed back down the track. The afternoon was spent at another alpine meadow down a 4WD track. It was a beautiful setting, with most of the orchids we had seen previously plus a nice group of *Gastrodia sesamoides* (Cinnamon Orchid) and some *Calochilus* buds.

At the camp, it was agreed that the season was early and we were lucky to see so many orchids in flower. Thanks go to Dick Thomson as leader, as well as Bill Kosky and Wendy Probert for sharing their special spots with us.

The Column: Eric Scanlen

1. *Pterostylis trifolia* in the Ruahines

Mike Lusk sent the Editor and the Column some pix on 8 November 2007. We thought they were either stumpy *Pterostylis venosa* or stumpy *P. humilis*. Obviously short stemmed from sun exposure(?) as *Pterostylis* are wont to be. It had erect lateral sepals, overtopping the galea just like *P. humilis* but a brown labellum with tawny tinges in the tepals and broad, obtuse leaves just like *P. venosa.* It was growing under the edges of the tangled leatherwood (*Olearia colensoi*) at ±1,000m altitude near Maharahara in the southern Ruahines. There was some unresolved debate, then the matter was dropped.

The Column was hunting for references re *Caladenia minor* agg. in the journals in April 2008 whilst amending the index thereto, (for some reason!) when Vic Vercoe's 23 Dec 1997 B&W prints of Ruahines *Pterostylis venosa/humilis*, figuratively jumped out of J73:**28**. This had to be Mike's orchid! Had another keen orchidologist taken photos of only stunted *P. venosa*? Not Pygmalion likely. Vic had got his from Tunupo and Rangiwahia Tracks out of Apiti and ±32k north of Maharahara Trig. In the captions, the Editor wasn't clear whether they were *P. venosa* or *P. humilis* — which sounds vaguely familiar.

The Editor's list of NZ orchids in J106:25 gave synonyms of *P. venosa* Col. as *P. confertifolia* Allan, 1926 and *P. trifolia* Col. 1899. The *Historical Series* had H.H. Allan's 1926 description, with no pix, on p100 of the Transactions, Part 1, but mostly in Latin. However, "Herba ±7cm alta" and "Folio 3…laminae 3-5cm longae, 1.5-2cm latae" didn't need a Latin scholar to equate plant height and the size of those three obtuse leaves. Allan's specimen came from the Ruahines, near Apiti, all of which added up to them being the same as Mike's and Vic's pix. T.F. Cheeseman had already lumped *P. trifolia* with *P. venosa* by 1926 so H.H. Allan ignored it before redescribing it as *P. confertifolia*. See what lumping does? Allan's type specimen sheet in CHR had been annotated *P. venosa* by Druce, and Dan Hatch had it, in the 1945 Transactions, as *P. humilis* Rog. on advice from R.S. Rogers himself, but why? It all sounds too familiar, doesn't it?

P. trifolia Col. from the Ruahines near Norsewood, also sounded like Mike's and Vic's pix from the description in *Historical Series* No. 1. Colenso admitted describing it from one withered specimen — which didn't help his cause — supplied by Mr A. Olsen. His 1896 description from two specimens of *P. venosa*, uncharacteristically has no comparison with, or even mention of *P. trifolia*, described by him only seven years earlier. He was 85 in1896 which may account for his memory slipping.

Incidentally, Ian St George has long said that the Otago so called *P. venosa* is taller than the N.I plant and lacks the cordate stigma. This definitely wants looking into by dedicated mainland orchidologists.

The lack of Latin diagnoses with Colenso's descriptions, allied with his type specimens usually going to Kew, probably accounted for most of his cherished species being put aside by Cheeseman, by H.H. Allan and subsequent chroniclers. For whatever reason, *P. trifolia* was bumped from *P. venosa* pillar to *P. humilis* post but was never considered as a distinct species for 119 years! Now it is. Look at Mike's **Fig. 13** and ask yourself, how did this abbreviated orchid ever get lumped in with the figurative pillar and post? Mike has sent the Column a highly detailed electronic pic of

about 100 healthy Maharahara specimens in a tight colony, all abbreviated, consistent with the taxon and the climate at 1,000-1,200ms, its preferred altitude.

The AGM this year will be at Camp Wakarara. The Sunrise Track leads off into the Ruahines thereabouts, only some 15k north of Vic's Rangiwahia site for *P. trifolia* Col., as the crow flies. The hills there rise to a mere 1,500m. It should be a doddle locating this November-December flowering orchid; if it grows this far north. But Mike doubts it, having done this two hour climb to the Sunrise Hut several times. The leatherwood is only scattered this far north and he has yet to see this unusual orchid hereabouts. However, the weather will be clement, of course, so it will be worth another look with a now clued up field party won't it?

Acknowledgements: Many thanks for yet another revelation by Mike Lusk and to Ian St George for useful leads from the Colenso species but no thanks to successive orchidologists who have previously ignored *P. trifolia/ confertifolia* into a century plus of ignominy.

Moral: Don't let discouragement from the experts put you off any unusual orchid finds. Hunt out the likely contenders in the *Historical Series* and the *Journals* then decide for yourselves if you have a new one or perhaps one that was long ago described then bumped, lumped or dumped.

2. *Thelymitra decora, T. nervosa* debate

It all started again, when Ian St George sent the Column that anonymous bud from a plain blue *Thelymitra* at Shag Point, Palmerston, on 30 Nov 07. Yes, it was the bud with the thrips in it and yes, the Column took it to be *Thelymitra* "bee" which you may have heard about, from Motutangi, 8 Nov 1995, Middle Rd Horopito, 1 March 1997 and Hatfields Beach, 30 Oct 1999. What "started again" was the old debate; was spotted *T. decora* a different taxon from spotless *T. nervosa*? In 2000, the Column lumped *T.* "bee" slides with *T. decora* Cheesem, then crossed that out and tagged them as *T.* "bee" because it was too different. Now they are relabelled *T. nervosa* because of the distinct similarity with Ian's anonymous bud — which he identified later — and with Colenso's description of *T. nervosa* in J65:28 and the Historic Series Vol. 1.

You see, the Shag Pt. spotless *T. nervosa* bud had no warts on the dark back of the post anther lobe (p.a. lobe), it had shallow ridges instead. See **Fig. 14** so it was obviously a different taxon from spotty, warty *T. decora* (**Fig. 15**). Not so fast though! Trawling through the literature turned up some irksome exceptions — to prove the rule? as they say?

Colenso described *T. nervosa* in 1888 from some 1879 flowers given to him by a visitor from "Highlands base of Mt Ruapehu (Tongariro Range)" and he commented on the "large, dark coloured flowers, their segments much veined." The veins or nerves are notable in the Hatfields Beach flowers too but hardly prominent enough for identifying the species. Checking from photos, the spotted flower's veins are less prominent and much the same as in other species of *Thelymitra*. No doubt Colenso's specimens were dried and pressed, making veins look more prominent? His description of *T. nervosa* is important for the prominent characters that he *didn't* mention; no spots on the petals and no dark warts on the back of the white based column yet the same William made a point of describing every small detail. Dr Brian Molloy (pers. comm.) had discovered plain blue *T. nervosa* on Mt Herbert at the top of Banks Peninsula but didn't say whether or not they had warts on the p.a. lobe. Ian had dark blue, spotless *T. nervosa* with warts from Shag Pt. in Dec 1986 (J23:11, 34:8,**9**) yet his 2007 bud from there, had no warts (**Fig. 14**). He also reported one plant from Shag Pt. in 1990, with a single spot on each petal and "tubercles [warts] more prominent than in northern *T. decora*". Also, at Jollies Reserve, near Hanmer (J53:15) in

early Jan 1995, Ian spotted (get it?) *T. decora*, "many without spots and a few lacking tubercles on the p.a. lobe" so it would appear that either the species is very variable or that hybrid taxa occur with mixed characters in these two widely separated sites; which tends to cloud the issue. Plants with mixed traits in one colony usually imply hybridism. Bruce Irwin's drawings sit on the fence, showing the grooved column back but no hint of either spotted or plain petals. *T. nervosa*'s top reported altitude of 840m at Banks Peninsula, is well below spotted *T. decora*'s 1,200m up the Mangatepopo Valley. Allan Ducker and the Column found only sadly mutated *T. decora* specimens here, on 18 Feb 1995, spotty and warty but otherwise seriously deformed with some lacking in essential parts. There are photos. Possibly there were non-mutated specimens earlier in the season. Colenso's *T. nervosa* type specimens were presumably from lower down the mountain. The Column's field party saw only spotted flowers, aplenty, at the Coromandel Pinnacles Hut on a hot 2 Dec 1995 (J59:20). Most p.a. lobes had minor mutations but columns were reproductively intact. A pink one had one or two spots on both dorsal sepal and labellum as well as the usual place on the lateral petals. Photos show only warty p.a. lobes here as also at Iwitahi and the Blowhard Reserve in the Kawekas on 5 Dec 1999. On the "bee" day, 30 Oct 1999, at Hatfields Beach, (J74:13,14,**18**) Ian, Allan Ducker and the Column puzzled over this plain blue with the attentive native bee. It had no spots so it couldn't be *T. decora*. The unspotted ones from the S. I. weren't considered either but should have been. Allan's videos from Horopito and Motutangi, later indicated that *T.* "bee" was widespread in the N. I. but after five years of it not showing again at Hatfields, it also has to be elusive. Now its clear identification with *T. nervosa* gives this species a wide distribution, at least from Motutangi to Shag Pt. but it could never be considered common. A creamy specimen, with purple spots and with warts (J83:**14**) was captured by Wolfgang Rysy, at Haurangi SFP in the Aorangis on 2 Dec 2001, during his brief visit to NZ. Notably, the spotty one has many colour variations and minor mutations whilst the plain blue stays plain blue without mutations. Note that *T. nervosa*'s anther stands erect at the back of the column as in **Fig. 16** but *T. decora*'s has the top tilted forward almost into the cluster of cilia as in **Fig. 15**.

T. nervosa/decora is undoubtedly an amphidiploid hybrid of *T.* aff. *ixioides* and *T. longifolia* [1]. Dawson et al [2] imply that both forms (only the *nervosa* epithet is employed) have 2n=54 chromosomes, the sum of 28 from *T.* aff. *ixioides* and 26 from *T. longifolia*. *T. pauciflora*, which also has 2n=26 chromosomes and a similar distribution to *T. longifolia*, doesn't come into the picture. Remember that amphidiploid hybrids such as *T. pulchella*, can amplify the variations in their parent species. However, the formal discontinuation of the title *T. decora* and substitution of *T. nervosa* has not been formally published so it is quite in order to use either or both classifications.

T.F. Cheeseman described *T. decora*, in the appendix to his 1906 Manual after stating, "I have been unable to identify…" four of Colenso's *Thelymitra* species including *T. nervosa*. In his 1925 Manual, there is no mention of *T. nervosa*. Moore and Edgar declared *T. nervosa* as "unresolved" on p122 of the 1970 Flora, Vol. 2. Brian Molloy's interim *T.* aff. *decora*, for the unspotted, warty form, was mentioned by the Editor in J34:8. *T. nervosa*, slipped unannounced, into the Orchid List in J65:7, Dec 1997, with Colenso's original description reprinted in the same issue on p. 28. Thus spotty with warts is going into the Journal's index as *T. decora* Cheesem, the plain blue with shallow ridges will be *T. nervosa* Colenso and the plain blues with warts can go in as hybrids.

Spotted *T. decora* occurs anomalously in subalpine habitat in Victoria and lowland in Australian Capital Territory (ACT) [3], according to recent texts. Backhouse & Jeanes [4] make a point of identifying it "by the strongly hooded, fairly smooth, column post anther lobe…". They would have read about its definitive warty p.a. lobe in Cheeseman's

description so perhaps that's why they emphasised the lack of this trait? Just a guess. One parent of this amphidiploid hybrid [1] is said to be *T. longifolia* which Australia have only in Norfolk Island (P. de Lange J70:17). Orchid seed doesn't blow back from NZ or Norfolk to Oz in our predominant westerlies does it? So, the Aussie species may be a different thing which just looks quite similar: an hybrid perhaps of Aussie *T. pauciflora* and *T. ixioides*? Or did one or both of our NZ taxa originate in Oz and seed blew across the ditch in the time honoured fashion? Refer p24 update.

Summarising; the Column's index description of these two taxa will include the characters in the table above right:

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2. Dawson, M.I. et al *Contributions to a chromosome atlas of the New Zealand flora* NZJ Bot 2007 Vol. 45: 611-684
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	T. nervosa	***T. decora***
Tepals	dark blue	blue-pink
Spotted	no	yes
Col. base	white	purple
P.a. lobe	4 ridged	warty
Anther	erect	jutting
Mutations	none seen	frequent
To altitude	840m	1,200m
Distribution latitudes	34° 50' to 45° 29'	37° 20' to 45° 29'

3. *Stegastyla lyallii* agg.—the gem of variability

Stegostyla lyallii had only two rows of disc calli, wrote Sir Joseph Dalton Hooker in 1864 [1] but only in his phrase, "Other characters as in *Caladenia minor*" which has only two rows of calli; except for *C. variegata* which he hadn't heard about. So what are we to think, when we come across flowers with four or six rows on the disc and two to eight rows on the midlobe? These occur in a range of sizes, and climate zones but were all dutifully reported for over a century as plain *Caladenia lyallii*, by devotees of the incomparable Hooker who were not about to step out of line. But Dorothy Cooper broke the spell in her own Newsletter 2:3, June 1982, mentioning big ones on Swampy Summit, Dunedin. Then Mark Moorhouse, in Newsletter 6, June 1983, dared to suggest that the 20mm flowers in Big Bush State Forest at 1500-2500 ft. (457-762m), were a different variety from the low-land taxon, furthermore, a rare, strange pair he found there, were different again. The rare pair were *Stegostyla* "minor" (cover J104) rediscovered in 2003 in the Baton Valley by Mark and his niece, Georgina Upson. Then Ian St George's Swampy Summit flower and Max Gibbs' big and small ones at Iwitahi, demolished Hooker's one-species spell, in colour, with three distinct taxa, in their 1990 *Natural History and Cultivation* book [2].

The Column's *Caladenia Imbroglio* in the J72, Sep 99, barely mentioned *Caladenia* [*Stegostyla*] *lyallii*, that southern jewel of stability to northerners, but he had started photographing them at Iwitahi in December 1993, storing all the slides in the *Caladenia lyallii* file. However, indexing the Journals, turned up the heretical reports above trigger-

ing a close examination of the file, producing *five* baffling *Stegostyla* heaps, three with albas. That "jewel of stability" changed overnight into the gem of variability! The more notable forms were announced with others of Mark's, for moral support, in J78:31 (and centrefold) March 2001.

Since then, a few sweeps south by the Column and others, emails from Kelly Rennell, Graham Dickson, Mark and Georgina plus mail from Barbara McGann, have had specimens closely scrutinised so that the heap of five plus three finally grew to eight taxa, three of them with albas and six of them with marginal calli to the midlobe thus excluding them from being *S. lyallii* (J63:4). The albas often occur with their red barred relatives, suggesting that some evolutionary survival advantage favours the all-whites, possibly for night flying pollinators. One alba, (*S.* "subalpine") is dominant at Iwitahi and *S.* "Iwitahi" has, so far, only white ones in Nelson. Monowai and Nelson still have other different *Stegostyla* taxa yet to be properly identified as mentioned briefly below.

Here, in less than adequate detail are those eight taxa plus their alba-forms, in approximate order of size so that you, the dedicated student, can lie in the moss and leaf litter, lens in hand and recognise or dispute the subjects of this earnest attempt to unravel the *Stegostyla lyallii* aggregate. Do please let us know exactly what you find.

Stegostyla alpina (R.S. Rogers) D.L. Jones et M.A. Clem. One to three, 20-30mm, flowers, 60-250mm tall, carmine or carmine-striped white bud, four rows of disc calli and stalked marginal calli to the base of the labellum midlobe (**Fig 18**) The ovary is green, often with three red sepal ridges and red glanded red hairs. Peduncle is maroon, thick with white hairs, bracts are brownish green to carmine. Leaf, 40-80 x 5-10mm, olive coloured, lanceolate, 3 ribbed and concave. Graham Dickson recorded a colony from 1,000m up on the Old Dunstan Road near Middlemarch on 23 Dec. 2006. The dried or bitten-off leaf tips in Fig. 17 and other images, indicate both the exposure at this windfarm site and the rabbit/hare population whose deposits carpeted the ground. Fortunately, the flowers seem unpalatable to the browsers. The orchids were not uncommon amongst invasive *Hieracium pilosella* whose ground hugging leaves let this orchid rise above the cover. Tightly clustered plants hint at vegetative spread; unlike *Caladenia.* Mark met this species on Mt Arthur in Nelson (J78:21) but his photo there was *S.* aff. *alpina*. He has found *S. alpina* 200m above the snowline to 1,600m on Mount Arthur and up the sides of nearby Gordon's Pyramid. Georgina had another look on 23 Dec 2007 (**cover, & Fig.18**) at 1,300m below Mt Arthur Hut and says that the recent series of droughts in Nelson meant that only single flowered plants appeared in 2007. Ian St George (pers. comm.) knew this orchid from 660m up on the Pineapple Flagstaff Walk, Dunedin where Lyall collected the *S. lyallii* specimens for Hooker. The Column caught a similar colony in an exposed, mossy ridge top in the Aorangis at 650m up, on 27 Nov 2004 and tagged it *S.* subalpine" (J94:33,**36**) but, upon close examination it's three flowers, and other characters as in **Fig. 19,** from a single flowered one, shows it to be *S. alpina.*

Stegostyla* aff. *alpina One or two, 19-27mm flowers with broad tepals. First recorded by Dorothy Cooper from Swampy Summit, (739m) Dunedin, Newsletter 2, June 1982, tag named by Ian St George in J63:6, after the similar Tasmania, *S. alpina*. *S.* aff. *alpina* has an off-white bud and 3-5 stalked, marginal calli to the midlobe base. (**Fig. 20**) The midlobe recurves to 225°, the four rows of disc calli on the top flower and the six on the lower flower, continue down the midlobe with a jumble of extras near the tip. Inside, the column is mostly dark red with irregular white bars. The labellum is red barred with no reports yet of an alba-form. A 105mm, 3 ribbed leaf which was measured had sparse, long, fine, white hairs like gossamer. The peduncle is maroon but pedicels, ovaries and bracts are green, differing here from *S. alpina*. Found especially on track-sides around the 900m mark, five veined, broad tepals, alpine to

subalpine, South Island, habitat, down to 400m at Waianakarua Reserve, Herbert but with shortish marginal calli here and down to 250m at Baton Valley. Notably, in twin flowered plants, the top flower has four rows of disc calli and the lower has six. (Mt Robert {J78:21}, Arthurs Pass and St Arnaud {J88:18} and Herbert {pers. comm. Barbara McGann}). Whether the four-row flower later develop six rows is still not known. Flowering time 20 Nov-23 December.

***Stegostyla* "subalpine"** One or two, 15-21mm flowers, ±156mm tall with a ±150mm red/green leaf, first reported in 1990 [2] by Max Gibbs at Iwitahi and tag named by the Column for its marginal calli to the labellum midlobe. Smaller than *S.* aff. *alpina* and restricted so far, to subalpine Iwitahi. In **Fig. 21**, tepals are not as broad as some; dorsal sepal is minutely acuminate with only four rows of calli down the labellum disc, increasing briefly to six by the midlobe base. Some specimens have four discrete rows; shades of *S.* aff. *alpina*? Note, two stalked, marginal calli at the junction of side lobe and midlobes. Most lack the red-bars inside the labellum and column as in Fig. E, but retaining the red peduncle to demonstrate that these are not just anthocyanin lacking freaks. Column wings are white and pendant. Sparse stipitate red glands, adorning the dorsal sepal and inside the base of the lateral sepals, are especially notable on the albas. Flowering time, 27 Nov to 9 Dec.

***Stegostyla lyallii* "4 row"** One or two, 17-21mm wide flowers, **Fig. 22,** five veined broad tepals and only sessile marginal calli on the midlobe with four rows of disc calli changing to four double rows in a jumble on the midlobe. Variable markings inside the column, from almost solid dark red to alternate red "leaves" lying either side of a white centre strip. Dark red bars to the white labellum side lobes, begin well back from the leading margin. Georgina has this as common in Nelson; so no doubt nobody bothers with it. The Column's only colony, at 660m on Brunner Peninsula, St Arnaud, had one of the plants flowering 21 days ahead of *S.* aff. *alpina* growing in almost the identical spot. No alba forms were present. Flowering time, 29 November.

***Stegostyla* "lytuck"** Solitary, 19-21mm wide flowers, subalpine with no alba form. Green ovary, pedicel and peduncle. Bud is off-white but the dorsal sepal at the Aorangis had crowded stipitate red glands. Noticed by the Column at Iwitahi (on film, after the event) and on site on Mill Track in the Aorangis. The translucent lobes of the upper column wings, are folded symmetrically at right angles across the front of the column as in **Fig. 23**. Four rows only of disc and of midlobe calli, four marginal calli at the junction of midlobe and side-lobe. *S.* "subalpine" is similar except for its differing column wings, alba-form, midlobe & marginal calli numbers and extra half rows of disc calli at times. Flowering time, 27 November to 13 December.

***Stegostyla* "minor"** One or two, 18-20mm wide flowers with narrow tepals. Mark's tag and his find of 1982 and 2003 et sec., announced and depicted in J95:**15**,16,**31**; 101:26,**31**; 104:1; 107:**18**. It has been too rare to take specimens for molecular checks as yet. The 1982 site has been afforested so the Baton Valley, some 40km away, remains its only know habitat at this time with two known colonies, 1.6km apart. The narrow dorsal sepal, is atypical of *S.* aff. *lyallii* agg, as are only two rows of disc and, midlobe calli, the latter, small and pale so easy to miss in a photo. The midlobe has five, long, marginal, calli **Fig. 24,** at the base, progressively shortening towards the acute tip which recurves 270°. The above characters may align *S. minor* more with the smaller *S. atradenia* than with *S. lyallii* agg. However, red sepal ribs on a green ovary are reminiscent of *S. alpina* or the red stemmed *Caladenia* (*Petalochilus*) *minor* (was *C.* aff. *chlorostyla*). Red midribs on the tepal outers make it almost as red in bud as *S. alpina*. Altitude range, 200-650m, flowering in the last two weeks of November.

***Stegostyla lyallii* (**Hook f.) D.L. Jones et M.A. Clem. Solitary flower ±18mm wide with narrow lateral tepals and minutely acuminate

dorsal sepal adorned with red glanded white hairs. Only two rows of disc calli (with perhaps a few strays) but four rows on the midlobe; has not been easy to find in the north and is unusual amid the *S. lyallii* "4row" taxon in Nelson. The Column has one only alba-form, **Fig. 25** from Iwitahi and one possible red barred specimen from Ketetahi Track. Mark has red barred ones (J78:Plate 1, Fig. 4) from Mt Robert. Nelson. The alba has two stray marginal calli on only one side of the midlobe base. David Jones's drawing [3] from specimens sent from NZ by Dr. Brian Molloy (J61:**8**; 63:**4**).shows the two rows and only sessile calli on the margin. Flowering time, early December in the North Island

***Stegostyla* "Iwitahi"** Single, ±18mm wide flowers, ±150 tall, went for years under Ian St George's *S.* aff. *lyallii* label in J46:2, see J76:**39** for this small one and **Fig. 26**. But "affinis" applies to any taxon like the named species so Georgina, who first spotted it away from Iwitahi at her Baton Valley place, recently proposed *S.* "Iwitahi", with no objections to date. Notably, her Nelson ones (**Fig. 27**) are so far, all greenish albas but with copious red glanded hairs on the green ovary plus a dark, near black leaf. Thus these too cannot be freaks lacking anthocyanin. This smallest *S. lyallii* agg, was common at Iwitahi hence shunned by photographers who favoured its more spectacular big brothers. Four rows of disc calli [J63:**5**; 76:**39**] continue down the midlobe but not onto the tip. It has narrow, three veined tepals and an acute, sometimes gable ended dorsal sepal contrasting with the umbrella-like affairs on most. The definitive midlobe is an equilateral triangular (J63:5 Fig. 3) with drop-side margins and tip. Two marginal calli decorate each forward side-lobe base. Flowering, early December at Iwitahi; early January in Nelson.

Four further taxa at least, are still in the wings including:—

1. a specimen of Mark's *S.* aff. *alpina* (J78:23) which grew two extra outer rows on the six row, unpollinated flower, within a week of it opening but the upper, four row flower, had been pollinated and faded.
2. Kelly's *S.* aff. *alpina* at only 170m altitude near Monowai, one specimen (J90:**26**) with a red midlobe
3. Mark's "small one" with broad tepals and a naked pink midlobe dropping straight down.
4. Mark's *S.* "Mt Robert (J78:bottom of page facing 26) and *S.* "Sherry River" (J107:18) may be the one taxon. More extended observations are sorely needed for these intriguing taxa.

Footnote David Jones et al, proposed the *Stegostyla* genus [4] which seemed logical considering the chromosome count 2n=48 which makes fertile hybrids highly unlikely with *Caladenia* (*Petalochilus*), 2n=38, despite being close on the phylogenetic tree [4, p417]. However, Hopper & Brown [5] disputed this and would have sunk *Stegostyla* to sub-genus ignominy. However, look at their definitive morphological differences (*Caladenia* in brackets) which include; calli on top of the midlobe (none to speak of), umbrella-like hooded dorsal sepal (narrow, flattish and usually upright), tepals are white inside, rarely with a red spot or two (greenish and pink, one alba form), larger flowers, 18-25mm across (8-20mm).connective to the anthers, obtuse short and papillose (acute, long, entire), 2-8 rows of disc calli (two regular rows, except one with scattered strays) but both genera have a cluster of 4-6 large calli by the column. The Column upholds *Stegostyla* as a distinct genus because the separation between the two genera is apparently complete, both morphologically and in chromosome counts.

Acknowledgements Many thanks to Barbara McGann for information about Waianakarua Reserve specimens, Kelly Rennell for the Southland taxon, Mark Moorhouse and Georgina Upson for information and critical analyses of taxa around Nelson, especially *S. alpina, S.* "minor" and *S.* "Iwitahi alba", to Graham Dickson for bringing home the fact that we do seem to have *S. alpina* in NZ, to Ian St George and Dot Cooper for their ground breaking early work and to all the many contributors for their patience with the Column's


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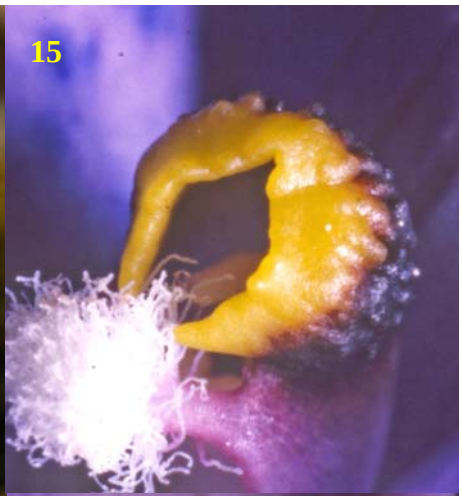
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harangues about *Stegostyla*.

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Fig.13. *Pterostylis trifolia* Colenso, synonymous with *P. confertifolia* Allan, photo by Mike Lusk from Maharahara in the southern Ruahines, 8 November 2007. Not to be confused with taller *P. venosa* or *P. humilis*.

Fig. 14. *Thelymitra nervosa* p.a. lobe showing two of the four shallow ridges down the back; no warts and almost white column base. From Shag Pt. Palmerston, 30 Nov 2007. The *Thrips* "Thelymitra" was the original subject.

Fig. 15. *Thelymitra decora*, p.a. lobe showing dark warts on the back, not ridges. Note also the top of the jutting anther inside and purple column base. Iwitahi 2 Dec 1994.

Fig. 16. *Thelymitra nervosa* alias *T.* "bee" with native bee checking the erect anther in the back of the column. Anther position is clearer in the 3-D pair. Note white column base. Hatfields Beach, 30 Oct 1999

Inside and outside back covers

Fig. 17: Graham Dickson's *Stegostyla alpina* 23 Dec 2006, at 1,000m altitude near Middlemarch. A tight cluster of plants suggests vegetative spread but note that two flowers and a red bud are all on one stem. Dry leaf ends are due to exposure at this wind-farm site.

Front cover, and Fig.18: *Stegostyla alpina* 23 Dec 2007 by Georgina Upson at 1,300m up on Mt Arthur, Nelson single flowered due to drought but with its carmine tepal outers, 225° midlobe curl, green ovary w. red sepal ridges, green to red bract and red peduncle

Fig. 19: *Stegostyla alpina* 27 Nov 2004, labellum on a single flowered specimen in the Aorangis colony. Note the discrete four rows of disc calli continuing down the midlobe; three marginal calli.

Fig. 20: *Stegostyla* aff. *alpina*, a six row flower at Arthurs Pass on 7 Dec 2002, sitting on its own leaf with those gossamer fine hairs. Note the contoured lateral sepals which thus maintain stiffness and shape. The marginal calli to the midlobe, curled under, typical of the genus, and the jumble of midlobe calli typical of the taxon.

Fig. 21: *Stegostyla* "subalpine", the predominant alba form with dark red peduncle just coming into view. The acuminate dorsal sepal has those stipitate red glands. Bits of *Pinus nigra* needles, keep the flower open to view. Four rows of calli increasing to six at the front on this specimen. Others have only four rows.

Fig. 22: *Stegostyla lyallii* "4 row" from St Arnaud, 29 Nov 2002. It has red barred labella, visible only to the pollinators unless wedged open. Out of sight are four rows of disc calli. Note four double rows of calli crowd atop a midlobe lacking marginal calli. Also, crowds of larvae-repellent hairs crowned with red glands on the ovary.

Fig. 23: *Stegostyla* "lytuck" 13 Dec 1997 Iwitahi. Lower column wings, folded square across front of column, are partly obscured by the anther. Four marginal calli; one from the side lobe, three from the midlobe but one is missing on the left. Note the dumpy little anther connective typical of all *Stegostyla.*

Fig. 24: *Stegostyla* "minor" by Georgina Upson from Baton Valley showing the very long marginal calli and the tightly curled midlobe. Check the cover of J104 for a frontal view of this same flower with its unique midlobe calli in only two rows. The rarity of this orchid has prevented specimens being taken for scientific evaluation.

Fig. 25: *Stegostyla lyallii* Hook. *f.* Iwitahi, 8 Dec 2000, the alba form, lacking red bars in labellum and column but with normal red pedicel and peduncle indicating that this is no anthocyanin lacking freak. Two rows of disc calli as indicated by Hooker, but extra small midlobe calli extending back onto the disc. Note minutely acuminate dorsal sepal adorned with stipitate red glands.

Fig. 26: *Stegostyla* "Iwitahi" (was *S.* aff. *lyallii*) the red barred form of our smallest *S. lyallii* agg flower from Iwitahi, 2 Dec 1994 has that long enclosing dorsal sepal and the labellum midlobe with the drop-sides and tip; no calli atop the tip. Two short, marginal calli to the base of the midlobe.

Fig. 27: *Stegostyla* "Iwitahi alba" by Georgina Upson from Baton Valley showing the unique drop-sides and tip to the labellum midlobe. Note the red glands to the ovary and red margin to the bract. No lack of anthocyanin here. Baton Valley plants are alba-forms, suggesting that these plants have evolved thus for a reason.


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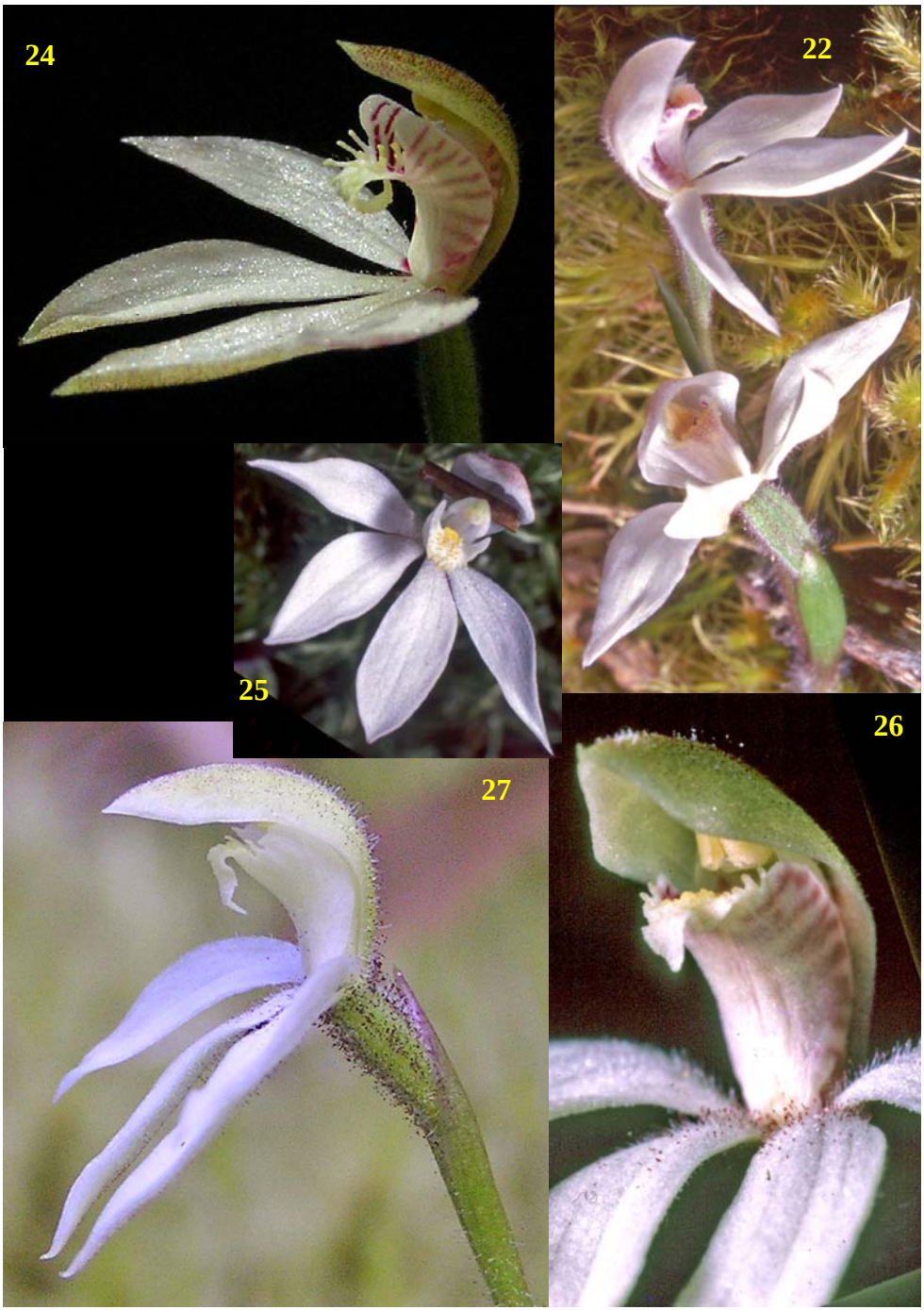
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