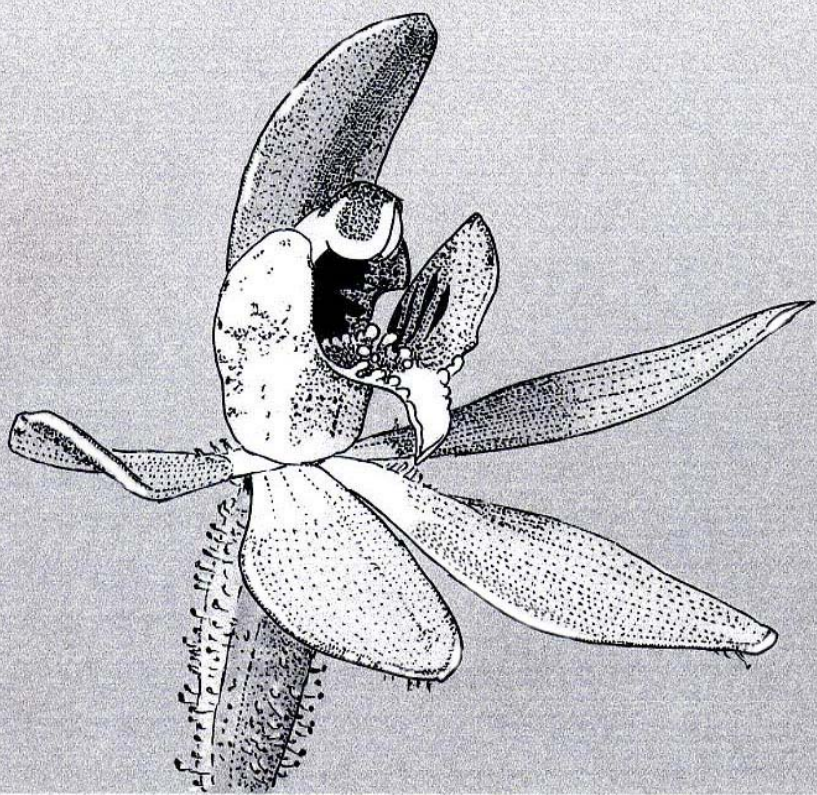


Petalochilus bartlettii

—a form common in the Far North, with two or three marginal calli at the base of the labellar midlobe, and a general lumpiness of the border of the midlobe distal to that.



Science is built up of facts, as a house is built up of stones; but an accumulation of facts is no more a science than a heap of stones is a house: Henri Poincaré 1854-1912.

1. The science of scents—3: sensuous smells, amorous aromas, and the odours of ardour

*To gild refined gold, to paint the lily,
To throw a perfume on the violet
...Is wasteful and ridiculous excess.*

—Shakespeare.

Look up “fragrance” on the net and you have to wade through a mire of sexually-explicit or -implicit websites touting aromatherapy body oils, sex attractants, love potions, pheromones and fragrant candles. There are some big industries based on fragrance out there. And its all about pheromones, folks.

Pheromones

Pheromones are volatile substances that act as sexual attractants for insects, and there is no doubt that some orchids use them to attract pollinators. The first pheromone discovered was from silkworm moths. A tiny amount of it made male moths beat their wings madly in a “flutter dance”. The chemically pure pheromone is called “bombykol” for the silkworm moth, *Bombyx mori* from which it was extracted. It signalled, “come to me!” from great distances. If a single female moth were to release all the bombykol in her sac in a single spray, all at once, she could theoretically attract a trillion males in an instant.

Many mammals have an additional scent organ to perceive smells designed to alter their behaviour or physiology. It is known as the vomeronasal organ (VNO). It consists of two small pits with tiny openings in their centres about a tenth of a millimetre wide.

Dogs can distinguish between the smell of T-shirts worn by non-identical twins (they couldn't tell the difference between identical twins because they smell identical). Dogs, bees and horses can smell fear in humans. Other animals use olfaction to identify their young. Studies of the nursing behavior of mother-pup pairs of Mexican free-tailed bats

showed that mother bats returned to areas where they had nursed previously; it appears scent cues are used to remember these places.

But although the human embryo develops a VNO, it then atrophies in adults. Like the appendix or the nictitating membrane of the third eyelid, our VNO has been thought to be vestigial, something we can do without. But now a group of American researchers claims to have discovered the VNO in humans, raising the possibility that we may be responding to pheromones too. A Utah research group examined subjects who virtually all had VNO pits - about 1cm up the nostril; they respond to quite different chemicals from those we can smell. And there seem to be clear gender differences - men's VNOs respond vigorously to steroids from the skin of a female and vice versa.

Not everyone is convinced: the Utah group raised \$12 million to exploit the discovery, and is already selling “his and hers” pheromone perfumes. Nobody has been able to replicate their work. But if we are not affected by pheromones, why do we produce them? The fluid from our sweat glands mixes with fatty material from sebaceous and apocrine glands, both found around hair follicles, and bacteria act on the mix leaving pheromones as leftovers. In puberty we grow hair in just those zones that fill with blood when we become excited, so they heat up. The warmer they get, the more easily the bacterial leftovers evaporate. “Dancing close and slow brings (most) men up against the apocrine and sebaceous supplies in her hair while she can nestle in to those in his armpit. Think twice before applying that deodorant”. Blecccchh.

But is that our VNO? or is it just ordinary

olfaction? Scents do serve a recognition function. We all have our own unique smell and can recognise and be recognised by our smell. Children can distinguish between the smell of their siblings and other children of the same age. Babies recognise their own mothers' smells and mothers recognise their own babies' smells.

Women can detect minute differences in male immunotype by smell. Immunity is conferred by HLA genes in humans, and these also determine our individual smell. We prefer the smell of people who have different HLA genes from our own, and that provides our offspring with an evolutionary advantage - more different HLA genes would give them a greater degree of immunity. We tend to be repelled by people whose immunotype is similar to our own. Perhaps we choose our mates on the basis of smell.

Fragrance and mood

Emotion can be communicated by smell. Women can discriminate between armpit swabs taken from people watching happy or sad films, and they can detect the smell of fear in the armpit secretions of people who watched terrifying films. Men were less good at this. So sweat contains a chemical signal which communicates the emotion. Furthermore armpit swabs taken from donor women at a certain phase in their menstrual cycle and wiped on the upper lip of recipient women can advance or retard menstruation in the recipients depending on the phase of the donor.

We seem to secrete compounds that can relay information about our mood to another person. If we know what these compounds are can they be used to alter mood?

We know mood can be altered by smells that recall events in our lives – the scent of new hay rouses memories of the golden weather of childhood, and I am happy. If we smell (or taste something) before a negative experience, that smell (or taste) is linked to that experience. Could we put that effect to advantage? if smell were to be associated with

a positive, healing treatment then could the smell itself substitute for the treatment once the link has been reinforced? In one study insulin was injected into healthy men daily for four days and their blood glucose was measured (it fell). At the same time, they were exposed to a smell. On the fifth day they were just given the smell—and their blood glucose fell.

Perfume makers claim certain smells are of themselves relaxing (i.e. independent of relaxing associations in people's memories). This can be tested with an electroencephalogram (EEG). One of the brain-waves measured by EEG is called the "alpha-wave". Increased alpha-wave activity is a sign of relaxation. Aromatherapy companies market perfumes with claims that they do relax you.

Does aromatherapy work? Researchers working with Prof Tim Jacob in Cardiff analysed the effect of two essential oils, ylang ylang and rosemary, on alpha-waves. The protocol was to pre-relax the subjects, record the EEG for 2 mins and then apply the odour to a face mask, wait 3 mins and then record another 2 mins. The mask was then removed, 3 mins allowed for equilibration and a further 2 mins of control activity was recorded. While there were clear trends (rosemary depresses alpha-activity while ylang ylang enhances it) the results were not perfect. In aromatherapy rosemary is used as a stimulant and ylang ylang is a soothing, relaxing aroma. The researchers concluded that ylang ylang and rosemary have measurable effects on brainwave activity, and in the direction anticipated from their reputed properties.

Scientific research has more often reported no effect for aromas on mood. The effects are most likely to be the result of memory conditioning an association. The mood effects probably also parallel the hedonicity of the odour (pleasant odours give rise to pleasant mood states while unpleasant odours give rise to unpleasant moods). Well yeah, but that assumes odours are inherently pleasant—ie they don't depend on memory associations.

The extraction and measurement of fragrance

Swiss scent specialists at Givaudan are involved in perfumes by Calvin Klein, Cartier and even Michael Jordan. They recently assisted a California Academy of Sciences scientist Kim Steiner, who analysed the aromas of orchids with the help of equipment and expertise from Givaudan (it's good to hear of industry supporting science). To collect a scent to study, Steiner would invert a glass dome over one or more flowers and pump the scent-infused air through a chemical "trap" that captured fragrances (Fig.1). The pump had to run for several hours to obtain enough scent for a chemical analysis. He would then send the traps to his collaborators in the research labs of Givaudan. After extracting the scents from the traps, they would inject them into a gas chromatograph-mass spectrometer that can identify the amounts and kinds of chemicals that make up a fragrance.

Givaudan uses these data to inspire new designer perfumes or candle scents. Steiner uses them to understand how floral scents evolve among closely-related species that share a specialized pollination system. He has been studying oil-producing orchids in the subtribe Coryciinae, which have pungent, soapy-smelling flowers, mostly pollinated by a single species of solitary oil-collecting bee.

New technology is appearing, bypassing the old chemical traps (usually volatile-absorbing solvent fats), and thus reducing the amount of fragrance needed for extraction, and thus the time taken: in one report solid-phase microextraction (SPME) and capillary gas chromatography-mass spectrometry (GC-MS) were developed for the identification of volatile compounds in consumer products. SPME minimizes sample preparation and concentrates volatile compounds in a solvent-free manner. Volatile flavour and fragrance compounds were extracted by SPME from the headspace (the air above the liquid) of vials containing shampoos, chewing gums, and perfumes, and analysed by GC-MS.

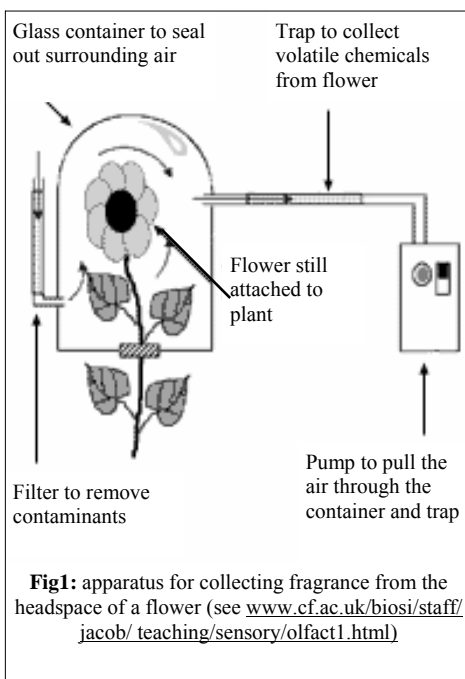


Fig1: apparatus for collecting fragrance from the headspace of a flower (see www.cf.ac.uk/biosi/staff/jacob/teaching/sensory/olfact1.html)

Headspace SPME was shown to be more sensitive than conventional headspace analysis of similar samples performed with an airtight syringe. Analysis times were less than 30 min, allowing multiple analyses to be performed in a typical laboratory class period.

Do you know? Astronauts tend to lose their sense of smell. This is thought to result from congestion in the nose resulting from increased capillary pressure as the heart no longer has to work against gravity. As a consequence the sinuses tend to fill up with fluid, giving rise to stuffiness similar to a head cold.

Acknowledgements

Material for this essay was gleaned from the following websites:

1. www.cf.ac.uk/biosi/staff/jacob/teaching/sensory/olfact1.html
2. www.schoolscience.co.uk/content/5/chemistry/smells/smellsch3pg1.html
3. www.dhushara.com/book/genes/mhc.htm
4. www.calacademy.org/science_now/where_in_the_world.html

2. Getting close and then cheating

Two close relationships in the orchid world are that between the orchid and its pollinator, and that between the orchid and its mycorrhizal fungus. It has been said that stable mutualisms must prevent cheating by a partner (getting benefit, bearing no cost), but some orchids do cheat.

Cheating the pollinator: many flowering plants are brightly-coloured and use a food reward like nectar to entice pollinators. Many orchids, however, cheat their pollinators - they are brightly-coloured but contain no reward. Gigord and co-workers found that “experienced bees that had already learned to visit nectar-producers did prefer cheats of similar colour. Fraudsters in some plant communities could therefore be mimics, even if they are similar to nectar-producers only in colour” [1].

Equally of course, some animals cheat: they may take nectar but do not carry pollen.

Cheating the fungus: green plants use the chlorophyll in their leaves to manufacture carbon compounds by photosynthesis, and they seek and retrieve water, minerals and other substances from the soil with fine rootlets. Terrestrial orchids store nutrients in their thick, fleshy bulbs or rhizomes. They very often do not have an extensive network of rootlets.

Soil fungi do have an immense, spreading network of fine threadlike hyphae, but they lack chlorophyll, so cannot produce their own carbon compounds.

Seems like a partnership made in heaven, and indeed 95% of flowering plants grow well only with this fungal partnership. The fungal hyphae act as extra roots for the plant. The fungi transfer carbon from the plant to themselves, and in return they transfer phosphorus, nitrogen, and other nutrients to the plants, as well as producing antibiotics and other protective devices. This living

arrangement is called mycorrhiza. Some plants can live without it, but cannot thrive.

Taylor and Bruns found that two nongreen orchids associated exclusively with two distinct ectomycorrhizal fungi [2]. Yet both orchids retained the internal mycorrhizal structure typical of photosynthetic orchids that do not associate with ectomycorrhizal fungi. This is proof of ectomycorrhizal epiparasitism in nature by orchids. Taylor and Bruns argue that “these orchids are cheaters because they do not provide fixed carbon to associated fungi...Mycorrhizae, like other ancient mutualisms, are susceptible to cheating”.

Selosse and co-workers concluded the nongreen European “birds-nest orchid” *Neottia nidus-avis* “is likely to derive its resources from surrounding trees, a mycorrhizal cheating strategy” [3].

Our nongreen orchids (the *Gastrodia*, *Molloybas* and *Danhatchia*) are cheats, as the late Dame Ella Campbell described so eruditely. Lacking chlorophyll, unable to provide carbon compounds for themselves or for the fungus, they nonetheless form “mutualistic” relationships with soil fungi, and through the fungi, derive carbon from nearby green plants. Furthermore, this may be true even of green terrestrial orchids that have dormant, underground years, when they may depend entirely on soil fungi.

If the world of close relationships is made up of givers and takers, in this one the fungus is the giver, and the orchid is the taker.

Did you know? Forest seedlings can get as much as a third of their food from trees nearby. The mycorrhizal fungi form an underground network to take nutrients from older trees. So adult trees may feed their young, just as animals do.

References

1. Gigord LDB, MR Macnair, M Stritesky and A Smithson. The potential for floral mimicry in a rewardless orchid: an experimental study. *Proc B* 2002 7 July 1389
2. Taylor DL and TD Bruns. Independent, specialized invasions of ectomycorrhizal mutualism by two nonphotosynthetic orchids. *Proc. Natl. Acad. Sci. USA* 1997. 94: 4510-4515.
3. Selosse. Communities and populations of sebacinoid basidiomycetes associated with the achlorophyllous orchid *Neottia nidus-avis* (L.) LCM Rich. and neighbouring tree ectomycorrhizae. *Molecular Ecology*. 11(9):1831-1844.

3. Science is debate

A number of readers have raised concerns with me about some of the material published in the Journal, particularly some of the contentious taxonomic views expressed by “The Column”, but also our use of the proposed new generic names. I want to make some points in response.

First, although the Journal aspires to be a scientific publication, with (soon, we hope) a section carrying formally peer reviewed papers of original scientific merit, it is also, as many scientific journals are, a vehicle for news, views, letters to the editor and subjective comment; so, at times, some material will appear to some readers to be opinionated or one-sided. They are right: it is. I don't think we need apologise for that, but we do now print a routine disclaimer, stating that views expressed by authors are not necessarily shared by the editor, the editorial board, nor the membership of the Group.

As I was thinking about this matter, coincidentally enough, the grand old *British Medical Journal* published a contentious paper suggesting passive smoking may not be as dangerous as had been claimed in the past. The esteemed editor (Richard Smith, an Auckland medical graduate, as it happens) was beaten about the head with a hail of protest from the anti-smoking lobby, and went so far as to devote his entire correspondence section to letters on that single subject.

He then wrote this thoughtful editorial (reproduced here in full) —

“I can't respond to all the points raised in this debate, and I thought I would simply share some reflections.

“Firstly, we've considered again whether we should have a blanket policy of refusing to publish research funded by the tobacco industry. We've twice considered this question in the BMJ and twice decided against. The BMJ is passionately antitobacco, but we are also passionately prodebate and proscience. A ban would be antiscience.

“Secondly, we are not in the ‘truth’ busi-

ness. Scientific truths are all provisional. Most of science falls away as new paradigms emerge. This doesn't mean that we are in the ‘lies’ business, but we are in the ‘debate’ business. We judged this paper to be a useful contribution to an important debate. We may be wrong, as we are with many papers. That's science.

“Thirdly, with research papers we first ask if we are interested in the question. We must be interested in whether passive smoking kills, and the question has not been definitively answered. It's a hard question, and our methods are inadequate.

“We then peer review the study, but we are well aware of the extreme deficiencies of peer review. Of course the study we published has flaws—all papers do—but it also has considerable strengths: long follow up, large sample size, and more complete follow up than many such studies. It's too easy to dismiss studies like this as ‘fatally flawed,’ with the implication that the study means nothing.

“Fourthly, I found it disturbing that so many people and organisations referred to the flaws in the study without specifying what they were. Indeed, this debate was much more remarkable for its passion than its precision.”

We do not, here at NZNOJ, peer review all our material (we would not wish some of it on reviewers). But in many other respects the issues addressed by old granny *BMJ* are also our issues. There are few lasting truths, so today's truths should be challenged. The Journal is a proper place for the expression of challenging views, preferably expressed as ideas rather than as established facts, and backed by reasoned argument.

I am also aware of Matthew Arnold's words on what he called the “rural researcher”: he occasionally makes a brilliant discovery. But more often, working in isolation from collegial criticism, he strides off one-eyed and alone, following false leads, reaching dead ends, and backing himself into corners.

So we too are pro-debate: we welcome challenging views, and we welcome comment and criticism from readers on material published in the Journal.

4. New departments

In this issue we begin two new regular departments, and pause our Historical Reprints for a time.

“**Irwin’s orchid art**” is a tribute to Bruce Irwin’s genius in illustrating orchids (and to lovers of alliteration). In his early years Bruce painted orchids in watercolours, a practice he gave up in favour of detailed scientific pencil drawings. Yet the beauty of his subjects emerges best from these delicate and sympathetic paintings.

“**Les belles inconnues**” (the beautiful unknown ones) is the delightful French name for undescribed European orchid taxa; we will illustrate a series of well-accepted New Zealand orchids that await formal description.

“**Botanical drawing**” will reproduce Walter Hood Fitch’s series of essays on flower painting, which will replace Historical reprints for a limited period. We hope Fitch’s clear instructions will stimulate readers to try their hand at botanical art, and that his acid wit will delight all readers.

5. *Nematoceras iridescens* in the far south

Kelley Rennell’s recent discoveries of a plant in the *Nematoceras rivularis* complex in Southland prompts me to remind readers of the plants near Dunedin regarded as a dysjunct population of *N. iridescens*, discussed in my *Nature guide*, and illustrated on the cover of J60. The flower is lighter coloured than some North Is forms, and brownish in Otago. The dorsal sepal is greenish with raised brown streaks. The labellum is very sharply deflexed, flaring widely; it sometimes lacks the beadlike callus at the entrance to the column cavity. In Otago the leaf emerges from the ground in November as a tight cone, which widens to reveal the immature flower, its petals and sepals curled above the other parts. As the flower matures, the leaf flattens and the sepals

and petals straighten. It likes wet areas, and can often be found in running water. I have seen it in the Leith Valley, Trotters Gorge, and Berwick Forest nature reserve near Dunedin.



The High Schools teacher and botanist (later politician) G.M. Thomson noted in his diary (in the Hocken Library) in 1879, “*Corysanthes*: the species found on stones in Nicholl’s creek — now fast disappearing — may be either *C. rivularis* or *C. macrantha*. Like so many other plants they probably run into one another”. This was *N. iridescens* and his difficulty in separating it from *N. macranthus* indicates that he understood the similarity (both species have round leaves), and was not, as the northern botanists, confused with *N. acuminatus*.

The surveyor John Buchanan who arrived in Otago in 1852 and sent back to Kew what J.D. Hooker described as the best collections of plants received from Australasia, explored much of the interior, often in the company of Dr Hector. The Hocken Library has a number of his diaries, and they give a vivid picture of the hardships of collecting.

He was a prolific artist. Sketchbooks in Dunedin, Wellington and Auckland are full of beautiful natural history and topographical drawings. He was chief illustrator for the *Transactions of the New Zealand Institute*, and drew and engraved many of the lithographs for its first nineteen volumes - “JB del.” appears on most. His “Milford Sound, looking North-West from Freshwater Basin” has been described as one of the masterpieces of New

Zealand landscape painting.

One of his sketchbooks in the Alexander Turnbull Library contains copies of the W.H. Fitch lithographs of New Zealand orchids; in the *Transactions* is also a lithograph of a plant he collected near Picton and called *Gastrodia hectori* - it was identified by Cheeseman as *Prasophyllum* aff. *patens*, and the specific epithet is likely to be



Nematoceras iridescens

Watercolour by John Buchanan, 25 Nov 1862

"Wet banks of creek under shade of trees, Northside, North East Valley".

applied to one of the taxa of this undescribed aggregate.

In one of the sketchbooks in Dunedin is a watercolour dated 25 November 1862 and labelled "wet banks of creek under shade of trees, North side, North East Valley. *Nematoceras* (?triloba)". It is *Nematoceras iridescens*.

Or is it? It has some subtle differences from many North Is plants, and the population is distant and isolated (dysjunct) from the otherwise southernmost plants I know of, near Levin. Has anyone seen it in the intervening territory?

Bruce Irwin thinks it is N. iridescens; 25 years ago he saw many plants resembling this on Stewart Is, and on 18 Oct 90 he drew a specimen I sent him from Leith Valley.



6. The New Zealand orchids: a list of names with a few brief notes

***Acianthus* R.Br. Prodr. 1: 321 (1810)** (*Acianthus* alliance).

Acianthus sinclairii Hook.f. *Fl. Nov. Zel.* 1: 245 (1853).

Acianthus fornicatus var. *sinclairii* (Hook.f.) Hatch. *Trans. Roy. Soc. N.Z.* 75: 369 (1945).

***Adelopetalum* Fitzg., *J. Bot.* 29: 152 (1891)** (*Bulbophyllum* alliance).

Adelopetalum tuberculatum (Col.) D.L. Jones, M.A. Clem. & Molloy. *Orchadian* 13(11): 498 (2002).

Bulbophyllum tuberculatum Col. *Trans. N.Z. I.* 16: 336 (1884).

Bulbophyllum exiguum as meant by Buchanan. *Trans. N.Z. I.* 16: 397 (1884), is not that of F.Muell. (1860).

***Adenochilus* Hook.f. *Fl. Nov. Zel.* 1: 246 t.56 (1853).**

Adenochilus gracilis Hook.f. *Fl. Nov. Zel.* 1: 246 t.56A (1853).

***Anzybas* D.L. Jones & M.A. Clem. *Orchadian* 13(9): 442 (2002) (*Corybas* alliance).**

Anzybas carsei (Cheesem.) D.L. Jones & M.A. Clem. *Orchadian* 13(10): 443 (2002).

Corysanthes carsei Cheesem. *Trans. N.Z. I.* 44: 162 (1912).

Corybas carsei (Cheesem.) Hatch. *Trans. Roy. Soc. N.Z.* 75: 367 (1945).

Corybas unguiculatus as meant by Moore. *Fl. N.Z. Vol II* 116: (1970) is not *Corysanthes unguiculatus* of R. Br. (1810).

Anzybas rotundifolius (Cheesem.) D.L. Jones & M.A. Clem. *Orchadian* 13(10): 443 (2002).

Nematoceras rotundifolia Hook.f. *Fl. Nov. Zel.* 1: 251 (1853).

Corysanthes rotundifolia (Hook.f.) Hook.f. *Handbk. N.Z. Fl.* 266 (1864).

Corybas rotundifolius (Hook.f.) Reichb.f. *Beitr. Syst. Pflk.* 67 (1871).

Corysanthes matthewsii Cheesem. *Trans. N.Z. I.* 31: 351 (1899).

Corybas unguiculatus as meant by Hatch. *Trans. Roy. Soc. N.Z.* 75: 367 (1945), is not *Corysanthes unguiculatus* of R.Br. (1810).

***Aporostylis* Rupp & Hatch. *Proc. Linn. Soc. N.S.W.* 70: 60 (1946).**

Aporostylis bifolia (Hook.f.) Rupp & Hatch. *Proc. Linn. Soc. N.S.W.* 70: 60 (1946).

Caladenia bifolia Hook.f. *Fl. Nov. Zel.* 1: 247 (1853).

Chiloglottis traversii F.Muell. *Veg. Chath. Is.* 51 (1864).

Caladenia macrophylla Col. *Trans. N.Z. I.* 27: 396 (1895).

Chiloglottis bifolia (Hook.f.) Schlecht. *Engl. Bot. Jb.* 45: 383 (1911).

***Calochilus* R.Br. Prodr. 1: 320 (1810)** (*Thelymitra* alliance).

Calochilus* aff. *herbaceus

Calochilus herbaceus McCrae *N.Z.N.O.G. Newsl.* 24: 9 (1987).

Calochilus campestris as meant by Hatch. *Trans. Roy. Soc. N.Z.* 77: 248 (1949), is not that of R.Br. (1810).

Calochilus paludosus R.Br. *Prodr.* 1: 320 (1810).

Calochilus robertsonii Benth. *Fl. Austr.* 6: 315 (1873).

Calochilus campestris as meant by Fitzg. *Austr. Orch.* 1(4): t.6 (1878), is not that of R.Br. (1810).

Calochilus campestris as meant by Cheesem. *Man. N.Z. Fl.* 686 (1906), is not that of R.Br. (1810).

***Chiloglottis* R.Br. Prodr. 1: 322 (1810).**

Chiloglottis cornuta Hook.f. *Fl. Antarct.* 1: 69 (1844).

Caladenia cornuta (Hook.f.) Reichb.f. *Beitr.Syst. Pflk.* 67 (1871).

Simpliglottis cornuta (Hook.f.) Szlach. *Polish Bot. J.* 46(1): 13 (2001).

Chiloglottis trapeziformis Fitzg. *Austr. Orch.* 1(3): t.10 (1877).

Chiloglottis formicifera as meant by Cheesem. *Trans. N.Z. I.* 33: 312 (1900), appears not to be that of Fitzg. (1877), but debate continues.

Chiloglottis valida D.L. Jones. *Austr. Orch. Research* 2: 43 (1991).

Simpliglottis valida (D.L. Jones) Szlach. *Polish Bot. J.* 46(1): 14 (2001).

Chiloglottis gunnii as meant by Cooper. *NZ Native Orchid Newsletter* 1: 4 (1982), is not that of Lindl. (1840).

***Corunastylis* Fitzg. *Austr. Orch.* 2 (3): t.1 (1888) (*Prasophyllum* alliance).**

Corunastylis nuda (Hook.f.) D.L. Jones & M.A. Clem. *Orchadian* 13(10): 461 (2002).

Prasophyllum nudum Hook.f. *Fl. Nov. Zel.* 1: 242 (1853).

Prasophyllum tunicatum Hook.f. *Fl. Nov. Zel.* 1: 242 (1853).

- Prasophyllum variegatum* Col. *Trans. N.Z. I.* 20: 208 (1888).
- Genoplesium nudum* (Hook.f.) D.L. Jones & M.A. Clem. *Lindleyana* 4(3): 144 (1989).
- Coronastylis pumila* (Hook.f.) D.L. Jones & M.A. Clem. *Orchadian* 13(10): 461 (2002).**
- Prasophyllum pumilum* Hook.f. *Fl. Nov. Zel.* 1: 242 (1853).
- Genoplesium pumilum* (Hook.f.) D.L. Jones & M.A. Clem. *Lindleyana* 4(3): 144 (1989).
- Corybas Salisb. Parad. Lond. t.83 (1807)*
(*Corybas* alliance).**
- Corybas cheesemanii* (Kirk) Kuntze. *Rev. Gen. Plant.* 6: 657 (1891).**
- Corysanthes cheesemanii* Hook.f. ex Kirk. *Trans. N.Z. I.* 3: 180 (1871).
- Corybas aconitiflorus* as meant by Hatch. *Trans. Roy. Soc. N.Z.* 75: 367 (1945), is not that of Salisbury (1807).
- Cryptostylis* R.Br. *Prodr.* 1: 317 (1810).**
- Cryptostylis subulata* (Labill.) Reichb.f. *Beitr. Syst. Pflk.* 15 (1871).**
- Malaxis subulata* Labill. *Nov. Holl. Spec. Pl.* 2: 62 t.212 (1806).
- Cyrtostylis* R.Br. *Prodr.* 1: 322 (1810).**
- Cyrtostylis oblonga* Hook.f. *Fl. Nov. Zel.* 1: 246 (1853).**
- Acianthus reniformis* var. *oblonga* (Hook.f.) Rupp & Hatch. *Proc. Linn. Soc. N.S.W.* 70: 59 (1946).
- Cyrtostylis reniformis* R.Br. *Prodr.* 1: 322 (1810).**
- Cyrtostylis rotundifolia* Hook.f. *Fl. Nov. Zel.* 1: 246 (1853).
- Cyrtostylis macrophylla* Hook.f. *Fl. Nov. Zel.* 1: 246 (1853).
- Caladenia reniformis* (R.Br.) Reichb.f. *Beitr. Syst. Pflk.* 67 (1871).
- Cyrtostylis oblonga* (Hook.f.) var. *rotundifolia* (Hook.f.) Cheesem. *Man. N.Z. Fl.* 685 (1906).
- Acianthus reniformis* (R.Br.) Schlecht. *Engl. Bot. Jb.* 34: 39 (1906).
- Acianthus reniformis* var. *reniformis* (Hook.f.) Rupp & Hatch. *Proc. Linn. Soc. N.S.W.* 70: 59 (1946).
- Danhatchia* Garay & Christenson. *Orchadian* 11(10): 469 f.471 (1995).**
- Danhatchia australis* (Hatch) Garay & Christenson. *Orchadian* 11(10): 469 f.471 (1995).**
- Yonia australis* Hatch. *Trans. Roy. Soc. N.Z. (Bot.)* 2: 185 (1963).
- Diplodium* Sw. *Ges. Naturf. Freunde Berlin Mag. Neuesten Enrdek. Gesamnten Naturk* 4: 84 (July 1810) (*Pterostylis* alliance)**
- Diplodium alobulum* (Hatch) D.L. Jones, Molloy & M.A. Clem. *Aust. Orch. Res.* 4: 70 (2003).**
- Pterostylis alobula* (Hatch) L.B. Moore. *N.Z. J. Bot.* 6: 486 f.3 (1969).
- Pterostylis trullifolia* Hook.f. var. *alobula* Hatch. *Trans. Roy. Soc. N.Z.* 77: 244 pl.30 (1949).
- Diplodium alveatum* (Garnet) D.L. Jones, Molloy & M.A. Clem. *Aust. Orch. Res.* 4: 70 (2003).**
- Pterostylis alveata* Garnet. *Vict. Naturalist* 59: 91 (1939).
- Diplodium brumalis* (L.B. Moore) D.L. Jones, Molloy & M.A. Clem. *Aust. Orch. Res.* 4: 70 (2003).**
- Pterostylis brumalis* L.B. Moore. *N.Z. J. Bot.* 6: 485 f.3 (1969).
- Pterostylis rubella* Col. *Trans. N.Z. I.* 18: 271 (1886).
- Pterostylis trullifolia* Hook.f. var. *rubella* Hatch. *Trans. Roy. Soc. N.Z.* 77: 244 (1949).
- Diplodium trullifolium* (Hook.f.) D.L. Jones, Molloy & M.A. Clem. *Aust. Orch. Res.* 4: 72 (2003).**
- Pterostylis trullifolia* Hook.f. *Fl. Nov. Zel.* 1: 249 (1853).
- Pterostylis trullifolia* Hook.f. var. *gracilis* Cheesem. *Trans. N.Z. I.* 47: 271 (1915).
- Pterostylis rubella* Col. *Trans. N.Z. I.* 18: 271 (1886).
- Drymoanthus* Nicholls. *Vict. Naturalist* 59: 173-5 f. (1943).**
- Drymoanthus adversus* (Hook.f.) Dockrill. *Australasian Sarcanthinae* 32 t.3 (1967).**
- Sarcochilus adversus* Hook.f. *Fl. Nov. Zel.* 1: 241 (1853).
- Sarcochilus breviscapa* Col. *Trans. N.Z. I.* 14: 332 (1882).
- Drymoanthus flavus* St George & Molloy. *N.Z. J. Bot.* 32: 416 f.1 (1994).**
- Earina* Lindl. *Bot. Reg. sub t.1699 (1834).***
- Earina aestivalis* Cheesem. *Trans. N.Z. I.* 51: 93 (1919).**
- Earina autumnalis* (Forst.f.) Hook.f. *Fl. Nov. Zel.* 1: 239 (1853).**
- Epidendrum autumnale* Forst.f. *Prodr.* 60 (1786).
- Earina suaveolens* Lindl. *Bot. Reg.* 29 (1843).
- Earina alba* Col. *Trans. N.Z. I.* 18: 267 (1886).

Earina mucronata Lindl. *Bot. Reg.* 20 sub t.1699 (1834).

Earina quadrilobata Col. *Trans. N.Z. I.* 15: 325 (1883).

Gastrodia R.Br. Prodr. 1: 330 (1810).

Gastrodia cunninghamii Hook.f. *Fl. Nov. Zel.* 1: 251 (1853).

Gastrodia leucopetala Col. *Trans. N.Z. I.* 18: 268 (1886).

Gastrodia minor Petrie. *Trans. N.Z. I.* 25: 273 t20 f5-7 (1893).

Gastrodia “long column” agg

There are a number of undescribed *Gastrodia* with a long column.

Gastrodia aff. sesamoides

Gastrodia sesamoides as meant by Cheesem. *Man. N.Z. Fl.* 697 (1906), is not that of R.Br. (1810).

Gastrodia “city” appears to be a variant.

Hymenochilus D.L. Jones & M.A. Clem. Austr. Orch. Res 4: 72 (2003) (Pterostylis alliance)

Hymenochilus tanypodus (D.L. Jones, Molloy & M.A. Clem.) D.L. Jones, Molloy & M.A. Clem. *Austr. Orch. Res* 4: 74 (2003).

Pterostylis tanypoda D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12(6): 273 (1997).

Pterostylis cynocephala as meant by Moore. *Fl. N.Z. Vol II* 135 (1970) and others (1970-1997), is not that of Fitzg. (1876).

Hymenochilus tristis (Col.) D.L. Jones, Molloy & M.A. Clem. *Austr. Orch. Res* 4: 74 (2003).

Pterostylis tristis Col. *Trans. N.Z. I.* 18: 271 (1886).

Pterostylis mutica as meant by Cheesem. *Trans. N.Z. I.* 15: 300 (1883), is not that of R.Br. (1810).

Ichthyostomum D.L. Jones, M.A. Clem. & Molloy. Orchadian 13(11): 499 (2002) (Bulbophyllum alliance).

Ichthyostomum pygmaeum (Smith) D.L. Jones, M.A. Clem. & Molloy. *Orchadian* 13(11): 499 (2002).

Dendrobium pygmaeum Smith. *Rees’ Cyclop.* 11: n.27 (1808).

Bulbophyllum pygmaeum (Smith) Lindl. *Gen. & Spec. Orch. Pl.* 58 (1830).

Bolbophyllum ichthyostomum Col. *Trans. N.Z. I.* 26: 319 (1894).

Linguella D.L. Jones & M.A. Clem. Austr. Orch. Res 4: 74 (2003) (Pterostylis alliance)

Linguella puberula (Hook.f.) D.L. Jones & M.A. Clem. *Austr. Orch. Res* 4: 75 (2003)

Pterostylis puberula Hook.f. *Fl. Nov. Zel.* 1: 249 (1853).

Pterostylis nana as meant by Hatch. *Trans. Roy. Soc. N.Z.* 77: 237 (1949), is not that of R.Br. (1810).

Pterostylis aff. *nana*.

Microtis R.Br. Prodr. 1: 320 (1810) (Prasophyllum alliance).

Microtis arenaria Lindl. *Gen. & Spec. Orch. Pl.* t.306 (1840).

Microtis biloba Nicholls. *Vict. Naturalist* 66: 93 f.J-L (1949).

Microtis oligantha L.B. Moore. *N.Z. J. Bot.* 6: 473 f.1 (1969).

Microtis magnadenia as meant by Hatch. in *Trans. Roy. Soc. N.Z. (Bot.)* 2: 185-9 (1963), is not that of Rogers (1930).

Microtis parviflora R.Br. *Prodr.* 1: 321 (1810).

Microtis javanica Reichb.f. *Bonplandia* 5: 36 (1857).

Microtis benthamiana Reichb.f. *Beitr. Syst. Pflk.* 24 (1871).

Microtis porrifolia (Sw.) R.Br. ex Spreng. var. *parviflora* (R.Br.) Rodway. *Tasm. Fl.* 159 (1903).

Microtis aemula Schlecht. *Bot. Jahrb. Syst.* 39: 37 (1906).

Microtis bipulvinaris Nicholls. *Vict. Naturalist* 66: 92-4, f.A-F (1949).

Microtis holmesii Nicholls. *Vict. Naturalist* 66: 93 f.G-I (1949).

Microtis unifolia (Forst.f.) Reichb.f. *Beitr. Syst. Pflk.* 62 (1871).

Ophrys unifolia Forst.f. *Fl. Ins. Austr.* 59 (1786).

Epipactis porrifolia Sw. *Kongl. Vetensk. Acad. Nya. Handl.* 21: 233 (1800).

Microtis porrifolia (Sw.) R.Br. ex Spreng. *Syst. Veget.* 3: 713 (1826).

Microtis banksii A.Cunn. *Bot. Mag.* 62: sub t.3377 (1835).

Microtis frutetorum Schldtl. *Linnaea* 20: 568 (1847).

Microtis viridis F.Muell. *Fragm.* 5: 97 (1866).

Microtis longifolia Col. *Trans. N.Z. I.* 17: 247 (1885).

Microtis papillosa Col. *Trans. N.Z. I.* 18: 269 (1886).

Microtis pulchella as meant by Lindley. *Gen. & Spec. Orch. Pl.* 395 (1840) is not that of R.Br. (1810).

There are a number of different taxa in the *Microtis unifolia* aggregate, perhaps including some of these.

Molloybas D.L. Jones & M.A. Clem. *Orchadian* 13(10): 448 (2002) (Corybas alliance).

Molloybas cryptanthus (Hatch) D.L. Jones & M.A. Clem. *Orchadian* 13(10): 448 (2002).

Corybas cryptanthus Hatch. *Trans. Roy. Soc. N.Z.* 83: 577 (1956).

Corybas saprophyticus Hatch. *Trans. Roy. Soc. N.Z.* 79: 366 t.71 (1952), is not that of Schlecht. (1923).

***Nematoceras* Hook.f. *Fl. Nov. Zel.* 1: 249 (1853) (Corybas alliance).**

Nematoceras acuminata (M.A. Clem. & Hatch) Molloy, D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).

Corybas acuminatus M.A. Clem. & Hatch. *N.Z. J. Bot.* 23: 491 (1985).

Corybas rivularis as meant by Cheesem. *Man. N.Z. Fl.* 697 (1906), and others (1906-1985) is not *Acianthus rivularis* of Cunn. (1837).

Nematoceras hypogaea (Col.) Molloy, D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).

Corysanthes hypogaea Col. *Trans. N.Z. I.* 16: 336 (1884).

Nematoceras iridescens (Irwin & Molloy) Molloy, D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).

Corybas iridescens Irwin & Molloy. *N.Z. J. Bot.* 34: 1 (1996).

Corybas "A" tagname; there is a geographically dysjunct population in Otago that may differ.

Nematoceras longipetala (Hatch) Molloy, D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).

Corybas macranthus (Hook.f.) Reichb.f. var. *longipetalus* Hatch. *Trans. Roy. Soc. N.Z.* 76: 580 t.60 (1) (1947).

Corybas longipetalus (Hatch) Hatch. *N.Z.N.O.G. J.* 47: 6 (1993), is not that of Schlecht. (1923).

Corybas "Waiouru" tagname.

Nematoceras macrantha Hook.f. *Fl. Nov. Zel.* 1: 250 (1853).

Corysanthes macrantha (Hook.f.) Hook.f. *Handbk. N.Z. Fl.* 266 (1864).

Corybas macranthus (Hook.f.) Reichb.f. *Beitr. Syst. Pflk.* 67 (1871).

North and South Island forms differ somewhat. Possible hybrids with members of the *N. triloba* group have been reported.

Nematoceras orbiculata (Col.) Molloy, D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).

Corysanthes orbiculata Col. *Trans. N.Z. I.* 23: 389 (1891).

Corybas orbiculatus as meant by Molloy & Irwin. *N.Z. J. Bot.* 34 (1): 5 (1996).

Corybas "short tepals" tagname.

Nematoceras pandurata (Cheesem.) Molloy, D.L.

Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).

Corysanthes rotundifolia (is not *Nematoceras rotundifolia* of Hook.f.) var. *pandurata* Cheesem. *Man. N.Z. Fl.* 366 (1925).

This has been regarded as a synonym of *Nematoceras rivularis*.

Nematoceras papa (Molloy & Irwin) Molloy, D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).

Corybas papa Molloy & Irwin. *N.Z. J. Bot.* 34 (1): 5 (1996).

Corybas "Mt Messenger" or *Corybas* "B" tagnames.

Nematoceras papillosa (Col.) Molloy, D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).

Corysanthes papillosa Col. *Trans. N.Z. I.* 16: 337 (1884).

This has been regarded as a synonym of *Nematoceras macrantha*.

Nematoceras rivularis (A.Cunn.) Hook.f. *Fl. Nov. Zel.* 1: 251 (1853).

Acianthus rivularis A.Cunn. *Compan. Bot. Mag.* 2: 376 (1837).

Corysanthes rivularis (A.Cunn.) Hook.f. *Handbk. N.Z. Fl.* 266 (1864).

Corybas rivularis (A.Cunn.) Reichb.f. *Beitr. Syst. Pflk.* 67 (1871).

Corysanthes rotundifolia as meant by Cheesem. *Man. N.Z. Fl.* 695 (1906), is not *Nematoceras rotundifolia* of Hook.f. (1853).

Corybas orbiculatus as meant by Moore. *Fl. N.Z. Vol II* 118 (1970) and others (1970-1996), is not *Corysanthes orbiculatus* of Col. (1891).

Corybas "Kerikeri" tagname.

The *Nematoceras rivularis* complex includes unnamed taxa tagged *N.* "Kaimai", *N.* "rest area", *N.* "Kaitarakahi", *N.* "whiskers" (*N.* "viridis").

Nematoceras triloba Hook.f. *Fl. Nov. Zel.* 1: 250 (1853).

Corysanthes triloba (Hook.f.) Hook.f. *Handbk. N.Z. Fl.* 265 (1864).

Corybas trilobus (Hook.f.) Reichb.f. *Beitr. Syst. Pflk.* 67 (1871).

Taxa in the *Nematoceras triloba* complex include the tiny May to July-flowering form *Corybas* "pygmy"; the later-flowering *N.* "Trotters" (*N.Z.N.O.G. Newsl.*; 28: 10-13 [1988]), *N.* "Rimutaka" (*N.Z.N.O.G. Journal*; 58: 8-9 [1996]), *N.* "round leaf", *N.* "craigielea", *N.* "darkie", *N.* "trisept", *N.* "trivwhite", and many others, including perhaps a tetraploid form on the Chathams (Molloy B.P.J. *Orchids of the Chatham Islands*. DOC, 2002).

***Orthoceras* R.Br. *Prodr.* 1: 316 (1810).**

Orthoceras novae-zeelandiae (A.Rich.) M.A. Clem., D.L. Jones & Molloy. *Catalogue Austr. Orch.* 100 (1989).

Diuris novae-zeelandiae A.Rich. *Essai Fl. Nov. Zel.* 163 t.25 f.1 (1832).

Orthoceras solandri Lindl. *Gen. & Sp. Orch. Pl.* 512 (1840).

- Orthoceras rubrum* Col. *Trans. N.Z. I.* 18: 273 (1886).
- Orthoceras caput-serpentis* Col. *Trans. N.Z. I.* 22: 490 (1890).
- Orthoceras strictum*** R.Br. *Prodr.* 1: 317 (1810).
The longer vs shorter floral bracts and pointed vs round labella are present in some N.Z. plants, suggesting *O. strictum* is in N.Z.
- Paracaleana Blaxell.*** *Contr. N.S.W. Natl. Herb.* 4: 281 (1972).
- Paracaleana minor*** (R.Br.) Blaxell. *Contr. N.S.W. Natl. Herb.* 4: 281 (1972).
- Caleana minor* R.Br. *Prodr.* 1: 329 (1810).
Caleya minor (R.Br.) Sweet. *Hort. Brit.* 385 (1827).
Caleya sullivanii F. Muell. *Chem. & Druggist, Aust. suppl.* 4: 44 (1882).
Caleana nublignii Nicholls. *Vict. Naturalist* 48: 15 (1931).
Paracaleana sullivanii (F. Muell.) Blaxell. *Contr. N.S.W. Natl. Herb.* 4: 281 (1972).
- Petalochilus Rogers. J. Bot.* 62: 65 (1924)**
(***Caladenia alliance***).
- Petalochilus alatus*** (R.Br.) D.L. Jones & M.A. Clem. *Orchadian* 13(9): 406 (2001).
Caladenia alata R.Br. *Prodr.* 1: 324 (1810).
Caladenia minor Hook.f. var. *exigua* Cheesem. *Man. N.Z. Fl.* 688 (1906).
Caladenia exigua Cheesem. *Trans. N.Z. I.* 45: 96 (1913).
Caladenia carnea R.Br. var. *alata* (R.Br.) Domin. *Bilb. Bot., Stuttgart Heft.* 85: 549 (1915).
Caladenia carnea R.Br. var. *exigua* (Cheesem.) Rupp. *Proc. Linn. Soc. N.S.W.* 69: 75 (1944).
Caladenia holmesii Rupp. *Vict. Naturalist* 70: 179 (1954).
Caladenia catenata (Smith) Druce var. *exigua* (Cheesem.) W.M. Curtis. *Students' Fl. Tasm.* pt 4A: 133 (1979).
- Petalochilus bartlettii*** (Hatch) D.L. Jones & M.A. Clem. *Orchadian* 13(9): 406 (2001).
Caladenia carnea R.Br. var. *bartlettii* Hatch. *Trans. Roy. Soc. N.Z.* 77: 402 (1949).
Caladenia bartlettii (Hatch) D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12(5): 227 (1997).
- Petalochilus calyciformis*** Rogers. *J. Bot. Lond.* 62: 66 t.571, 1-3 (1924).
Moore (1970) treated this as an aberrant form.
- Petalochilus chlorostylus*** (D.L. Jones, Molloy & M.A. Clem.) D.L. Jones & M.A. Clem. *Orchadian* 13(9): 406 (2001).
Caladenia chlorostyla D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12(5): 223 f.1 (1997).
- Caladenia catenata* as meant by Cooper. *Field guide to the N.Z. native orchids* 17 (1984), is not that of Druce (1917).
Caladenia "green column" tagname. Scanlen argues that *P. chlorostylus* may be a synonym for *P. minor*. A similar but distinct plant is known as *P. aff. chlorostylus*. *Arethusa catenata* and *Caladenia alba* are names used for Australian plants once confused with NZ taxa.
- Petalochilus minor*** (Hook.f.) D.L. Jones & M.A. Clem. *Orchadian* 13(9): 410 (2001).
Caladenia minor Hook.f. *Fl. Nov. Zel.* 1: 247 t.56b (1853).
Caladenia carnea var. *pygmaea* (Rogers) Rupp. *Proc. Linn. Soc. N.S.W.* 69: 74 (1944).
Caladenia carnea R.Br. var. *minor* (Hook.f.) Hatch. *Trans. Roy. Soc. N.Z.* 77: 401 (1949).
Caladenia catenata var. *minor* (Hook.f.) W.M. Curtis. *Students' Fl. Tasm.* pt 4A: 106 (1979).
The status of *Petalochilus minor* is not clear: it may be a synonym for *P. chlorostylus* or may be the true identity of *P. aff. chlorostylus*.
- Petalochilus nothofageti*** (D.L. Jones, Molloy & M.A. Clem.) D.L. Jones & M.A. Clem. *Orchadian* 13(9): 410 (2001).
Caladenia nothofageti D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12 (5): 226 f.1 (1997).
- Petalochilus saccatus*** Rogers. *J. Bot. Lond.* 62: 66 t.571, 4-7 (1924).
Moore (1970) treated this as an aberrant form.
- Petalochilus variegatus*** (Col.) D.L. Jones & M.A. Clem. *Orchadian* 13(9): 410 (2001).
Caladenia variegata Col. *Trans. N.Z. I.* 17: 248 (1885).
Caladenia "big pink" tagname. Some flowers have a clear two rows of calli on the labellum, others have extra calli scattered to either side of the two rows.
- Petalochilus aff. fuscatus***
A small pink *Petalochilus* which appears similar to this variable Australian species, with 1-3 flowers (see Scanlen. *N.Z.N.O.G. J.* 1999: 72: 22). It appears to be identical with Matthews' s Ms. *Caladenia* "nitida-rosea".
- Petalochilus aff. pusillus***
A tiny pink *Petalochilus* with broad oval sepals and petals, an incurved dorsal sepal and a triangular labellar midlobe grows near Wellington and in Northland (W.M. Curtis. *Students' Fl. Tasm.* Pt. 4A: 133 [1980]).
- Plumatochilos DL Szlachetko Polish Bot.J.* 46 (1): 22 (2001) (Pterostylis alliance)**
- Plumatochilus tasmanicus*** DL Szlachetko *Polish Bot.J.* 46 (1): 22 (2001)
Pterostylis tasmanica D.L. Jones. *Muelleria* 8(2): 177 (1994).
Pterostylis squamata as meant by Hook.f. *Fl. Nov. Zel.* 1: 249 (1853), is not that of R.Br. (1810).
Pterostylis barbata as meant by Cheesem. *Man. N.Z. Fl.* 683 (1906), is not that of Lindl. (1840).

- Pterostylis plumosa* as meant by Cooper. *Field guide to N.Z. native orchids* 51 (1981), is not that of Cady (1969).
- Prasophyllum R.Br. Prodr. 1: 317 (1810)**
(Prasophyllum alliance).
- Prasophyllum colensoi* Hook.f. *Fl. Nov. Zel.* 1: 241 (1853).
- Prasophyllum pauciflorum* Col. *Trans. N.Z. I.* 18: 273 (1886).
- Prasophyllum rogersii* as meant by Hatch. *Trans. Roy. Soc. N.Z.* 76: 290 (1946) is not that of Rogers & Rees 1921.
- Probably a number of taxa, possibly including Irwin's *P.* "A" and *P.* "B" (*N.Z.N.O.G. J.* 79: 9-10).
- Prasophyllum aff. patens**
- Gastrodia hectori* Buchanan. *Trans. N.Z. I.* 19: 214 (1886).
- Prasophyllum patens* as meant by Cheesem. *Man. N.Z. Fl.* (1906) is not that of R.Br. (1810).
- Prasophyllum suttoni* as meant by Hatch. *Trans. Roy. Soc. N.Z.* 76: 291 (1946) is not that of Rupp (1928).
- At least one undescribed New Zealand taxon.
- Pterostylis R.Br. Prodr. 1: 326 (1810)**
(Pterostylis alliance)
- Pterostylis agathicola* D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12(6): 266 (1997).
- Pterostylis montana* (Hatch) var. *rubricaulis* (Cheesem.) Hatch. *Trans. Roy. Soc. N.Z.* 77: 240 pl.23 (1949).
- Pterostylis graminea* (Hook.f.) var. *rubricaulis* H.B. Matthews ex Cheesem. *Man. N.Z. Fl.* 351 (1925).
- Pterostylis* "rubricaulis" tagname.
- Pterostylis areolata* Petrie. *Trans. N.Z. I.* 50: 210 (1918).
- Pterostylis auriculata* Col. *Trans. N.Z. I.* 22: 489 (1890).
- Pterostylis* "Catlins" tagname.
- Pterostylis australis* Hook.f. *Fl. Nov. Zel.* 1: 248 (1853).
- Pterostylis banksii* A.Cunn. *Compan. Bot. Mag.* 2: 376 (1837).
- Pterostylis emarginata* Col. *Trans. N.Z. I.* 15: 328 (1883).
- Pterostylis speciosa* Col. *Trans. N.Z. I.* 22: 488 (1890).
- Pterostylis subsimilis* Col. *Trans. N.Z. I.* 28: 611 (1896).
- Pterostylis aff. banksii**
- A smaller taxon than true *P. banksii*, common around Wellington, and apparently found elsewhere (see *N.Z.N.O.G. J.* 80: 14, 19).
- Pterostylis cardiostigma* D.A. Cooper *N.Z. J. Bot.* 21: 97 (1983).
- Pterostylis cernua* D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12(6): 267 f (1997).
- Pterostylis foliata* Hook.f. *Fl. Nov. Zel.* 1: 249 (1853).
- Pterostylis gracilis* Nicholls. *Vict. Naturalist* 43: 324-6 (1927).
- Pterostylis vereenae* Rogers. *Trans. Roy. Soc. S.A.* 38: 360-1 f.18 (2) (1914).
- Pterostylis graminea** Hook.f. *Fl. Nov. Zel.* 1: 248 (1853).
- There may be several taxa in the *P. graminea* complex, including one tagged *P.* "sphagnum".
- Pterostylis humilis* Rogers. *Trans. Roy. Soc. S. A.* 46: 151 (1922).
- Pterostylis irsoniana* Hatch. *Trans. Roy. Soc. N.Z.* 78: 104 t.18 (1950).
- Pterostylis irwinii* D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12(6): 269 (1997).
- Pterostylis* "Erua" tagname.
- Pterostylis micromega** Hook.f. *Fl. Nov. Zel.* 1: 248 (1853).
- Pterostylis polyphylla* Col. *Trans. N.Z. I.* 22: 489 (1890).
- Pterostylis furcata* Lindl. var. *micromega* Hatch. *Trans. Roy. Soc. N.Z.* 80: 326 (1953).
- Pterostylis montana* Hatch. *Trans. Roy. Soc. N.Z.* 77: 239 t.22 (1949).
- Pterostylis aff. montana agg.**
- Includes several undescribed taxa.
- Pterostylis nutans* R.Br. *Prodr.* 1: 327 (1810).
- Pterostylis matthewsii* Cheesem. *Trans. N.Z. I.* 47: 46 (1915).
- Pterostylis oliveri* Petrie. *Trans. N.Z. I.* 26: 270 (1894).
- Pterostylis paludosa* D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12(6): 271 (1997).
- Pterostylis montana* Hatch. var. *linearis* Hatch. *Trans. Roy. Soc. N.Z.* 77: 243 pl.29, 2 (1949).
- Pterostylis* "linearis" tagname.
- Pterostylis patens* Col. *Trans. N.Z. I.* 18: 270 (1886).
- Pterostylis banksii* Hook.f. var. *patens* (Col.) Hatch. *Trans. Roy. Soc. N.Z.* 75: 370 (1945).
- Pterostylis porrecta* D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12(6): 272 (1997).
- Pterostylis* aff. *graminea*.
- Pterostylis silvicultrix* (F.Muell.) D.L. Jones, Molloy & M.A. Clem. *Aust. Orch. Res.* 4: 66 (2003).
- Pterostylis banksii* var. *silvicultrix* F.Muell. *Veg. Chath. Is.* 51 (1864).
- Pterostylis venosa* Col. *Trans. N.Z. I.* 28: 610 (1896).
- Pterostylis confertifolia* Allan. *Trans. N.Z. I.* 56: 32 (1926).

Pterostylis trifolia Col. *Trans. N.Z. I.* 31: 281 (1899).

Singularibas (Hook.f.) D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002) (Corybas alliance).

***Singularibas oblongus* (Hook.f.) D.L. Jones & M.A. Clem. *Orchadian* 13(10): 449 (2002).**

Nematoceras oblonga Hook.f. *Fl. Nov. Zel.* 1: 250 t.57B (1853).

Corysanthes oblonga (Hook.f.) Hook.f. *Handb. N.Z. Fl.* 266 (1864).

Corybas oblongus (Hook.f.) Reichb.f. *Beitr. Syst. Pflk.* 67 (1871).

There are two or three taxa included in this complex. One was named in manuscript by Matthews as *Corybas* "aestivalis".

***Spiranthes* L.C.Rich. *Orchideas Eur. Annot.* 20, 28, 36 (1817).**

***Spiranthes novae-zelandiae* Hook.f. *Fl. Nov. Zel.* 1: 243 (1853).**

Spiranthes australis as meant by Hook.f. *Handb. N.Z. Fl.* 272 (1864), is not that of Lindl. (1824).

Spiranthes sinensis as meant by Rupp & Hatch. *Proc. Linn. Soc. N.S.W.* 70: 58 (1946), is not that of Ames (1908).

Spiranthes lancea as meant by Hatch. *Trans. Roy. Soc. N.Z.* 82: 614 (1954), is not that of Backer, van den Brink & van Steenis (1950).

The name *Neottia sinensis* was never applied to N.Z. plants.

***Spiranthes* "Motutangi"**

Tagname for endangered Far North taxon similar to *S. australis*.

***Stegostyla* D.L. Jones & M.A. Clem. *Orchadian* 13(9): 411 (2001) (Caladenia alliance).**

Stegostyla* aff. *alpina

Plants closer to *S. alpina* than to *S. lyallii* are in N.Z. See St George. *N.Z.N.O.G. J.* 63: 4 (1997).

***Stegostyla atradenia* (D.L. Jones, Molloy & M.A. Clem.) D.L. Jones & M.A. Clem. *Orchadian* 13(9): 414 (2001).**

Caladenia carnea R.Br. var. *minor* forma *calliniger* Hatch. *Trans. Roy. Soc. N.Z. (Bot)* 2: 187 (1963).

Caladenia atradenia D.L. Jones, Molloy & M.A. Clem. *Orchadian* 12 (5): 221 (1997).

Caladenia iridescens as meant by Hatch. *N.Z.N.O.G. Newsl.* 16: 1 (1985) is not that of Rogers (1920).

"*Caladenia calliniger*", *Caladenia* aff. *iridescens* tagnames.

***Stegostyla lyallii* (Hook.f.) D.L. Jones & M.A. Clem. *Orchadian* 13(9): 413 (2001).**

Caladenia lyallii Hook.f. *Fl. Nov. Zel.* 1: 247 (1853).

There seem to be further taxa in *S. lyallii* agg, including a small form from Iwitahi and Nelson Lakes.

***Thelymitra* J.R. Forster & Forst.f. *Char. Gen. Pl.* 97 t.49 (1776) (Thelymitra alliance).**

***Thelymitra aemula* Cheesem. *Trans. N.Z. I.* 51: 94 (1919).**

***Thelymitra carnea* R.Br. *Prodr.* 1: 314 (1810).**

Thelymitra imberbis Hook.f. *Fl. Nov. Zel.*; 1: 244 (1853).

Thelymitra carnea R.Br. var. *imberbis* (Hook.f.) Rupp & Hatch. *Proc. Roy. Soc. N.S.W.* 70: 59 (1946).

***Thelymitra cyanea* (Lindl.) Benth. *Fl. Austr.* 6: 323 (1873).**

Macdonaldia cyanea Lindl. *Bot. Reg.* 25 (1840).

Thelymitra uniflora Hook.f. *Fl. Antarct.* 1: 70 (1844).

Thelymitra venosa as meant by Cheesem. *Man. N.Z. Fl.* 671 (1906), is not that of R.Br. (1810).

Thelymitra venosa R.Br. var. *typica* Hatch, var. *cedricsmithii* Hatch, var. *cyanea* Hatch. *Trans. Roy. Soc. N.Z.* 79: 390-1 (1952).

Thelymitra* *xdentata

A sterile hybrid of *T. longifolia* x *T. pulchella*.

Thelymitra dentata L.B. Moore. *N.Z. J. Bot.* 6: 478 f.2 (1969).

***Thelymitra formosa* Col. *Trans. N.Z. I.* 16: 338 (1884).**

Thelymitra circumsepta as meant by Hatch. *N.Z.N.O.G. J.* 65: 8 (1997), is not that of Fitzg. (1878).

***Thelymitra hatchii* L.B. Moore. *N.Z. J. Bot.* 6: 477 f.2 (1969).**

Thelymitra pachyphylla as meant by Hatch. *Trans. Roy. Soc. N.Z.* 79: 394 pl.79 D-H (1952), is not that of Cheesem. (1906).

***Thelymitra intermedia* Bergg. *Minneskr. Fisiog. Sallsk. Lund* 8: 21 f (1878).**

Thelymitra longifolia J.R.Forster & Forst.f. var. *stenopetalata* Hatch. *Trans. Roy. Soc. N.Z.* 79: 396 pl.80 F-H (1952).

Thelymitra longifolia J.R.Forster & Forst.f. var. *intermedia* Hatch. *Trans. Roy. Soc. N.Z.* 79: 396 pl.80 J (1952).

Was tagged *T.* "pseudopauciflora" for a time. *Thelymitra colensoi* Hook.f. *Handbk. N.Z. Fl.* 271 (1864) has been identified with *T. intermedia*.

Thelymitra* aff. *ixioides

Thelymitra ixioides as meant by Hook.f. *Handb. N.Z. Fl.* 669 (1864), is not that of Swartz (1800).

Thelymitra ixioides var. *typica* (Hook.f.) Rupp & Hatch. *Proc. Linn. Soc. N.S.W.* 70: 59

(1945).

T. xioioides is insect pollinated in Australia - the N.Z. taxon is not.

Thelymitra longifolia J.R. Forster & Forst.f. *Char. Gen. Pl.* 98 t.49 (1776).

Serapias regularis Banks & Sol. ex Forst.f. *Prodr.* 59 (1776).

Thelymitra forsteri Swartz. *K. Svenska Vet. Akad. Handl.* 21: 228 (1800).

Thelymitra nemoralis Col. *Trans. N.Z. I.* 17: 249 (1885).

Thelymitra purpureofusca Col. *Trans. N.Z. I.* 17: 249 (1885).

Thelymitra alba Col. *Trans. N.Z. I.* 18: 272 (1886).

Thelymitra cornuta Col. *Trans. N.Z. I.* 20: 206 (1888).

Thelymitra longifolia J.R. Forster & Forst.f. var. *alba* (Col.) Cheesem. *Man. N.Z. Fl.* 339 (1925).

Thelymitra longifolia J.R. Forster & Forst.f. var. *forsteri* Hatch. *Trans. Roy. Soc. N.Z.* 79: 396 pl.80 B-E (1952).

Thelymitra aristata as meant by Hatch. *Trans. Roy. Soc. N.Z.* 79 pl. 79-80 (1952), is not that of Lindl. (1840).

***Thelymitra* aff. *longifolia* agg.**

Some undescribed taxa that appear to be insect-pollinated. Some may be named above.

Thelymitra malvina M.A. Clem., D.L. Jones & Molloy. *Austr. Orch. Research* 1: 141 (1989).

Thelymitra matthewsii Cheesem. *Trans. N.Z. I.* 43: 177 (1911).

Thelymitra nervosa Col. *Trans. N.Z. I.* 20: 207 (1888).

Thelymitra decora Cheesem. *Man. N.Z. Fl.* 1151 (1906).

***Thelymitra* aff. *pauciflora* agg.**

Thelymitra pauciflora as meant by Cheesem. *Man. N.Z. Fl. 2nd Ed.* 340 (1925), and others until now, is not that of R.Br. (1810).

There is a range of taxa in this agg.

Thelymitra pulchella Hook.f. *Fl. Nov. Zel.* 1: 244 (1853).

Thelymitra concinna Col. *Trans. N.Z. I.* 20: 207 (1888).

Thelymitra fimbriata Col. *Trans. N.Z. I.* 22: 490 (1890).

Thelymitra pachyphylla Cheesem. *Man. N.Z. Fl.* 1151 (1906).

Thelymitra caesia Petrie. *Trans. N.Z. I.* 51: 107 (1919).

T. pulchella is a very variable species, yet all of these appear to have features that are relatively stable in some populations.

Thelymitra sanscilia Irwin ex Hatch. *Trans. Roy.*

Soc. N.Z. 79: 397 pl. 81 B-E (1952).

Thelymitra tholiformis Molloy & Hatch. *N.Z. J. Bot.* 28: 111 f.1 (1990).

Thelymitra intermedia as meant by Moore. *Fl. N.Z. Vol II* 129 (1970), is not that of Berggr. (1878).

***Thelymitra* “Ahipara”**

A cleistogamous, unnamed taxon from the far north.

***Thelymitra* “Comet”**

A large, late-flowering *Thelymitra* from the Kaweka range. Appears to be sterile, so probably a hybrid.

***Thelymitra* “Whakapapa”**

An undescribed taxon from Ruapehu, may be *Thelymitra purpureofusca* Col. *Trans. N.Z. I.* 17: 249 (1885).

***Thelymitra* “darkie”**

An undescribed taxon from the Far North.

***Thelymitra* “rough leaf”**

An undescribed taxon from the Far North.

***Thelymitra* “sky”**

An undescribed taxon from the Far North.

***Townsonia* Cheesem. *Man. N.Z. Fl.* 692 (1906). (Acianthus alliance).**

Townsonia deflexa Cheesem. *Man. N.Z. Fl.* 692 (1906).

Townsonia viridis as meant by Schlecht. *Fedde Repert. Spec. Nov. Regn. Veg.* 9: 250 (1911), is not *Acianthus viridis* of Hook.f. (1860).

Acianthus viridis as meant by Moore. *Fl. N.Z. Vol II* 107 (1970), is not that of Hook.f. (1860).

***Waireia* D.L. Jones, M.A. Clem. & Molloy. *Orchadian* 12(6): 282 (1997).**

Waireia stenopetala (Hook.f.) D.L. Jones, M.A. Clem. & Molloy. *Orchadian* 12(6): 282 (1997).

Thelymitra stenopetala (Hook.f.) *Fl. Antarct.* 1: 69 (1844).

Lyperanthus antarcticus Hook.f. *Fl. Antarct.* 2: 544 (1847).

***Winika* M.A. Clem., D.L. Jones & Molloy. *Orchadian* 12(5): 214 (1997).**

Winika cunninghamii (Lindl.) M.A. Clem., D.L. Jones & Molloy. *Orchadian* 12(5): 214 (1997).

Dendrobium biflorum as meant by A. Rich. *Essai Fl. Nov. Zel.* 221 (1832), is not that of Swartz (1800).

Dendrobium cunninghamii Lindl. *Bot. Reg.* 21 sub. t.1756 (1835).

Dendrobium lessonii Col. *Trans. N.Z. I.* 15: 326 (1883).

These notes are one person’s opinion on what are accepted species and generally recognised but yet unnamed taxa in New Zealand in 2003. This is the

botanical drawing: 1

This is the start of a new series on botanical drawing. The material was written by WH Fitch as eight articles that first appeared in the *Gardeners' Chronicle* in 1869.

Walter Hood Fitch (1817-1892)

Walter Hood Fitch must be regarded as the most prolific of all botanical artists: he published at least 9600 drawings, the majority in colour.

He was discovered by William J. Hooker, then Professor of Botany in Glasgow, and when the latter took over as Director of Kew Gardens, Fitch became sole illustrator of Curtis's *Botanical Magazine*, and remained so for forty-three years. He was a lithographer as well as an artist, and would often draw directly onto the stone.

J.D. Hooker wrote of the "unrivalled skill in seizing the natural characters of plants" of this "incomparable botanical artist". He must have been fast: he would draw standing, a stone block in one hand and a pencil in the other, the bold freehand lines laid on with an unerring sweep of the pencil. In the Hookers' *Icones plantarum* is an illustration of *Corybas cheesemani* drawn by W.H. Fitch, and another of *Earina mucronata*.

His great achievement was what he could do from dried herbarium specimens. Somehow he was able to recreate the plant in its original freshness.

He left Kew after an argument about money, and shortly afterward his health began to fail. He died of a stroke in 1892, and the *Gardeners' chronicle* said in its obituary –

“As a botanical artist Fitch had no rival for grace and fidelity to Nature. His vast experience gave him a power of perception and insight such as few, if any, artists have possessed in greater, if equal degree.”

Fitch was artist for New Zealand's first illustrated *Flora*, the third volume of J.D.

Hooker's *The Botany of Ross's Antarctic Voyage* (1844-60). He was later to do the engravings (after Archer's drawings) for the *Flora Tasmaniae*. Among the drawings in the *Flora Novae Zelandiae* are those of *Nematoceras macrantha*, *Singularybas oblongus*, *Adenochilus gracilis*, and *Petalochilus minor*. Coloured and uncoloured versions of the whole work were printed.

Fitch wrote a series of articles about botanical drawing for the *Gardeners' Chronicle*, published in 1869. He protested he was no writer – “I am more accustomed to the pencil than the pen” – but his prose is elegant and even plain for the day, and his sarcastic wit sharp and accurate.

He wrote about the differences between scientific botanical drawing, and flower painting, and gave clear advice on technique: treat the leaves as if they were skeletonised; place the flower correctly on its stalk; sketch the lower leaves first if they are erect and elongated, the upper if the leaves hang down; the stem is never straight so a ruler should never be used; if hairs are represented at all they should be done correctly.

These articles will be reproduced over the next four issues of our Journal.

Botanical drawing: 1

by Walter Hood Fitch

It has been suggested to me by some who, I trust, are better able to appreciate my qualifications than my native modesty will allow me to do, that a few hints on botanical drawing, from my pen, might be useful to some of the readers of the *Gardeners' Chronicle*. Yielding to their superior judgment—though I am more accustomed to the pencil than the pen—I shall venture to make a few remarks, which, however simple and trying they may appear to me, and perhaps to others, may be of some service to those who are ambitious of doing correctly what any one is supposed to be capable of doing, viz., sketching a flower, or a plant.

I have frequently heard the remark, that Mr. So-and-so is a good colourist but a bad draughtsman—a very left-handed compliment, equivalent to that of being pronounced able to write but not to spell, to paint a portrait but not to represent the individual. It is as well that correct drawing and colouring should be found in the same work, for the absence of the former cannot be compensated by any excellence in the latter. Most beginners in flower drawing are desirous of rushing into colour before they can sketch—unaware that the most gorgeous daub, however laboured, if incorrectly drawn is only a crude effort at “paper staining,” as it is technically termed. The eye of the qualified critic is not to be foiled by colour. Facility in colouring is easily acquired, but a correct eye for drawing is only to be rendered by constant observation.

I may have occasion hereafter to say something about colouring—botanical and fanciful, for there is a difference between the two—similar to that between a portrait, and a mere picture. A strictly botanical drawing generally represents but one or two individual plants, and they must be equally correctly drawn and coloured. A fancy drawing or group in proportion to the number of plants introduced may have the details judiciously slurred over, for the eye of the observer cannot comprehend the minute points of all at a glance, so there is no labour lost. I may state that this dependence upon the carelessness of the observer is very frequently carried too far—and if at all times far from flattering, is often offensive; and that the works of many professors of flower drawing are not calculated to improve the public taste for the domain of Flora.

To argue the propriety or correctness of anything may seem like discussing a truism, but correctness is very often a question of degree, or a matter of taste. We judge according to the light that is in us.

I have particularly in view the education of young gardeners; for in the numerous works intended for their instruction, I am not aware that there are any hints in relation to botanical

or flower drawing. Judging from the omission, one might almost suppose it was thought that if the pupils but mastered half the matter that was written for their improvement, they might well dispense with so trying an accomplishment. I need not dilate on the usefulness to gardeners of a knowledge of sketching, not flowers only, but anything in the way of their profession, for many have expressed to me their regret at their inability, being deterred from testing it by imaginary difficulties. I may state that a slight sketch is often more explanatory than any description; and to collectors and cultivators, figures of the plants they collect or deal in are particularly desirable. I purpose making a few remarks, which I hope will be of assistance to beginners in overcoming the difficulties they may encounter in their first attempts. The simple means I have employed in the course of some years' experience will be found applicable equally to drawing dried as well as living plants.

I may premise that a knowledge of botany, however slight, is of great use in enabling the artist to avoid the errors which are occasionally perpetrated in respectable drawings and publication, such as introducing an abnormal number of stamens in a flower; giving it an inferior ovary when it should have a superior one, and *vice versa*. I have frequently seen such negatively instructive illustrations of ignorance—quite inexcusable, for a little knowledge would enable them to be avoided. It is more creditable that one's works should furnish an example than a warning.

Materials.—For flower drawing smooth paper is best suited, as it allows of finer touches and lines, and smoother washes of colour.

The best pencil to use is an H. for delicate subjects, such as white flowers, and an F. for leaves, and any part which is to receive dark colours, so that the lines may not be entirely obliterated.

In botanical subjects it is sometimes desirable to represent the roots, bulbs, etc., but they are so easily drawn that I think no special directions are necessary.

- to be continued...

Irwin's orchid art: *Pterostylis patens*



Pterostylis Banksii var. *patens*

Kahui Track, Mount Egmont.
Elevation 4000 ft. 3 Feb. 46

Les belles inconnues: *Nematoceras* "Trotters"



1. Unnamed, lumped and unconfirmed orchids in NZ

Can you believe that there are 100 unnamed and lumped orchid taxa in NZ? Look at the Column's *list* below and you can check for yourself. It lists all the most credible records in the Newsletters and Journals, from issues 1 to 89 including a number pending. Messrs Kelly Rennell and Sid Smithies have sent a number of excellent photos by wire from Southland and their publication is pending. Mark Moorhouse has already given us a taste of what is in store in Nelson in J85:25-26. Do feel free to dispute any in the *list* that catch in the craw. Five have already been deleted that were either un-lumped or were doubled-up because of inadequate tagging. Possibly there are others but most who have called have had additions not deletions.

The plethora of *Pterostylis* aff. *montana* taxa have only two *list* entries at this stage. The Column has his slide collection in 12 heaps of these montane to subalpine plants, flowering from 17 Sept at Mt Messenger Saddle through to 5 Jan at Whakapapa; some have twisted labella, some don't; some have long dorsal sepal and/or lateral petals, some have them short etc. Which are distinct taxa and which are hybrids is not at all clear but the Column believes it would be safe to add another 5 to the *list*. Perhaps a concerted effort by those familiar with them, similar to the *Nematoceras triloba* agg. project mentioned below, will sort out *P.* aff. *montana*. Any volunteers?

When the *list* stood at 91 only, Ian St George was inclined to drop the six alba forms because they don't normally earn specific botanical classification but the Column left them in, firstly to give these strange whites and pale greens some recognition for conservation purposes and secondly because some of them exhibit characters distinct from

their normally coloured brethren. If the albas are left in limbo, they could easily get ignored into oblivion; some may have been so already!

Many alba forms have been labelled albinos but it seems they rarely are. When each one is studied or the author is contacted for more information, what usually turns up are either red veins and spots on the leaf or red glands on the dorsal sepal or faint pink stripes, yellow spots or yellow calli in the labella thus discounting the genetic lack of pigment which is albinism. Green doesn't count because in all probability, it stems from the chloroplasts whose DNA is distinct from the plants'.

One neglected alba was Margaret Menzies' white *Molloybas cryptanthus* at Omoana (Fig. 7 p26) which always *flowered on top of the moss or leaf litter* unlike *M. cryptanthus* s.s. which has reddish flecks and flowers out of sight beneath the litter. This alba once flowered prolifically and set seed so it may not be the isolated freak that some thought. The normal plants are saprophytic with no chlorophyll anyway so the albas appear pure white as you can see in Ian St George's picture but, they were "flushed red in their throats" [J49:15] so they weren't albinos either. The colony hasn't been seen since 1994, so disappointing those "two dozen or so" souls [J57:22] on Margaret's celebrated field trip of 5 August 1995. This may be one that has already got ignored into alba oblivion yet its character, of flowering above the moss, indicates that it could well have been a distinct taxon.

Another could be No. 3 on the *list*, Doug McCrae's green form of *Calochilus* aff. *herbaceus* [J62:13] from the Earth Wall Track at Te Pahi. It was reported from 1990 until 22 Oct 1996 but not since. The track site has become overshadowed by burgeoning kanuka which might explain its disappearance. The hope is that tubers are still in the soils awaiting suitable conditions.

The puzzle with the alba forms is the lack of in-betweens with the normally coloured plants which usually grow alongside. Some may be

recessive mutants like the White Tigers of Rewa in India whose normally coloured hybrids breed either true orange or white (still with black stripes and non-pink eyes) but with no in-betweens either. Others may be distinct species with separate (moth?) pollinators as the Column suspects for the subalpine *Nematoceras* “trihwhite”. Any volunteers please, to sit by them all night (not the tigers, the *N.* “trihwhites”!) to check on pollinators?

Most vexing in the *list* are the increasing number of *Nematoceras triloba* agg. which are surfacing as, Tricia Aspin, Bruce, Ian, Mark, Kelly, Sid, the Column and others get into their straps detailing all those old and new puzzles in this decade of the triloba. The two newly tagged taxa *N.* “tridodd” and *N.* “tribrive” presented in this issue, set the ball rolling for this detailed review of the unnamed, unrecognised and lumped orchids. The number of *N. triloba* agg. on the list stands at 26 as at 12 October 2003 but Sid has at least three others from uncharted territory in Southland still getting analysed, Mark is in control of another raft from Nelson and we just know there will be more, don’t we? Please get your strange local *N. triloba* taxa onto the report sheet and into the Editor for comparison and assessment. You could well have a new species there. If you are fairly sure it is unreported, and reasonably wide-spread, please get at least three fresh specimens with habitat details etc, to Brian Molloy for DNA checks and herbarium record.

2. List of unnamed, lumped and unconfirmed orchids

1. *Aporostylis* “sanscalli” DC J2:2; 84:35
2. *Calochilus* aff. *herbaceus* MAC J34:3; 70:33
3. *C.* aff. *herbaceus* alba DMcC J35:37; 62:13
4. *E.* aff. *aestivalis* PdeL J83:7
5. **Gastrodia* “city” MG J78:27
6. **G.* “l. c. Aorangi” ISTG J66:29-31; 70:18
7. **G.* “long column black” DC J5:1
8. **G.* “l. c. Holt” Otautau, SS J87:27
9. **G.* aff. *sesamoides* BPJM J51:9, 67:22
10. *Gastrodia* “l. c. Owhango” RB J67:21
11. *Gastrodia* “l. c. St Arnaud” EAS J67:21
12. **G.* “shauroko” L Hauroko KR J87:26
13. **Microtis* “A” ISTG J67:5
14. **M.* “B” ISTG J63:21; 67:5
15. **M.* “C” ISTG J67:5
16. **M.* aff. *oligantha* Chatham PdeL. J73:29
17. **M.* aff. *parviflora* Gt Barrier PdeL. J77:10
18. **Molloybas cryptanthus* alba MM J49:15
19. *Nematoceras* “craigielea” ISTG J77:7; 79:3,4
20. **N.* “darkie” GJ J35:33; 77:8
21. **N.* aff. *hypogaea* MM J54:9; 85:25
22. **N.* aff. *iridescens* “Makatote” JBI J82:16; 83:16
23. **N.* aff. *iridescens* “Otago” ISTG J60:1,2
24. **N.* “Kaimai” JBI J47:9
25. *N.* “Kaitarakihī” EDH J1:3; 74:18, Fig 6
26. **N.* “Mangahua” JBI J44:11
27. **N.* *papillosa* WC J87:8
28. *N.* “pygmy” GJ, GD J73:11
29. **N.* “pygmy” alba BT J84:36
30. **N.* “rest area” JBI J47:9
31. *N.* “Rimutaka” ISTG J58:9
32. **N.* “round leaf” JBI J44:12; 58:7,
33. **N.* “Sphagnum” JBI J44:11; 63:10
34. **N.* “tribaldy” SS pers. comm.
35. *N.* “tribrive” AD J58:19
36. *N.* “tridodd” ID J82:12
37. **N.* “trigreen fuzz” MM J85:26 Fig 22; 87:11
38. *N.* “trijuly” AD J85:14
39. *N.* “trileafbract” EAS J87:7,11
40. **N. triloba* “A” JBI J78:16
41. **N. triloba* “B” JBI J78:17
42. **N. triloba* “C” JBI J78:18
43. **N. triloba* “D” JBI J78:19
44. *N.* “triloba round leaf” JBI J63:9,10
45. **N.* “trimidwhanga” MM J85:24,25
46. *N.* “trisept” GLD J76:37,40
47. **N.* “trismithies” KR pers. comm

48. *N. "triram" SS pers. comm
 49. *N. "triwan" MM J85:26
 50. N. "triwhite" MG J24:6; 63:12
 51. N. "Trotters" ISTG J28:13
 52. N. "veil" AD J58:19; 74:18**Fig 5**
 53. *N. *viridis* (N. "whiskers") HBM J79:18
 54. **Orthoceras strictum* J78:35, plate 14
 55. *Petalochilus* aff. *bartlettii* JBI J78:20
 56. P. "chloroleuca" HBM J72:27**Fig 4**
 57. *P. aff. *chlorostylus* JBI J83:16;17
 58. P. "nitida rosea" HBM J62:9
 59. *P. aff. *pusillus* ISTG J82:15
 60. P. "red stem" GS J39:12; J66:26
 61. P. "speckles" AD J58:35; 74:16,18² **Fig 9**
 62. P. aff. *variegatus* EAS J78:31 Plate 6
 63. **Prasophyllum* "A" JBI J79:9
 64. *P. "B" JBI J79:9
 65. **Prasophyllum* aff. *patens* MAC J34:3; 54:1
 66. **Pterostylis* aff. *banksii* ISTG J80:14,18
 67. **Pterostylis* "Kahui" JD J67:25
 68. *Pt. montana* sensu Moore J74:35,40**Fig 4**
 69. *Pt.* aff. *montana* ±6 taxa MG J17:1 to ISTG 88:9
 70. *Pt.* "Peninsula" GS J86:29,31
 71. **Pterostylis* "Sphagnum" PdeL J74:12; 80:5
 72. *Singularibas* "aestivalis" HBM J61:16, 77:15
 73. *S. oblongus* alba DD J35:24; 87:8
 74. **Spiranthes* "Motutangi" DMcC 35:40; 71:1
 75. **Sp.* "southern NZ" BJPM J22:8
 76. *Stegostyla* aff. *alpina* ISTG J 76:25
 77. *St. lyallii* JDH J63:5
 78. *St. lyallii* alba EAS J78:34 Plate 13
 79. *St. lyallii* "4 row" EAS J88:18,19,21
 80. *St.* aff. *lyalli* MG J35:20; 46:2
 81. *St.* aff. *lyalli* alba MG J37:12
 82. *St.* "lytuck" EAS J78 plate 10, 88:18
 83. **St.* "Mt Robert" MM 78:22,26plate 3
 84. *St.* "subalpine" MM J6:3
 85. *St.* "subalpine" alba EAS 78:26³plate 9
 86. *Thelymitra* "Ahipara" BPJM J44:17; 67:24
 87. *T.* "bee" EAS 74:13,14,18¹
 88. *T.* "Comet" WL J67:32; 71:4

89. *T.* "darkie" DMcC J35:33; 62:10
 90. *T. imberbis* TFC Manual J73:24
 91. **T.* aff. *ixioides* MAC J34:3; 86:10
 92. *T.* aff. *longifolia* "norm" BG J15:3
 93. *T.* aff. *longifolia* "deep cleft" EAS J70:31
 94. *T.* aff. *longifolia* "stunted" EAS J86:10,12
 95. **T.* aff. *pauciflora* MAC J34:4
 96. **T.* aff. *pauciflora* "dark" DMcC 24:10
 97. *T.* "rough leaf" DMcC J24:11; 77:22
 98. *T.* "sky" AD J58:36; 70:33,34
 99. *T.* "tholinigra" EDH J85:10,15
 100.**T.* "Whakapapa" JBI J54:2, 83:16

References are for first cogent reports and bold page numbers for illustrations; see index to NZNOG Journals for further references.

Key J = NZNOG Journal or Newsletter, * = not described in *Les Belles Inconnues*

Initiators: RB Ross Bishop, TFC Thomas Cheeseman, MAC Mark Clements, WC William Colenso, ID Ian Dodd, DC Dorothy Cooper, GLD Graham Dickson, JD John Dodunski, AD Allan Ducker, GD Gael Donaghy, DD Dianne Duder, BG Beryl & Bob Goodger, EDH Dan Hatch, JDH Joseph Hooker, MG Max Gibbs, GJ Graeme Jane, JBI Bruce Irwin, PdeL Peter de Lange, WL Bill Liddy, DMcC Doug McCrae, HBM Henry Matthews, MM Margaret Menzies, BPJM Brian Molloy, MM Mark Moorhouse, KR Kelly Rennell, ISTG Ian St George, EAS Eric Scanlen, SS Sid Smithies, GS Gordon Sylvester, BT Brian Tyler.

3. *Nematoceras* "pygmy", "trijuly", "tridodd" & "tribrive"

At Wattle Bay, Awhitu Peninsula, Ian Dodd showed Tricia Aspin and the Column a *Nematoceras triloba* agg. which had finished flowering on 20 Nov 2001 [J82:12] but whoops, it had its sheathing bract well below the petiole axis or node. So the Column exclaimed that it was not *N.* "pygmy", which is common across the harbour entrance in the

Waitakeres. Both his companions threw him sidelong glances at this blurted announcement but Tricia swiftly followed it up, two seasons later, flowering not in June or July but August; it wasn't *N. "pygmy"* was it? The much maligned sheathing bract was handy after all. On 11 Aug 2003 the Column drove around the Manukau to record yet another exciting (?) *N. triloba* agg. addition to the list, in response to Tricia's call. How do you like *Nematoceras "tridodd"*? (*triloba* at Ian Dodd's place). Colony 1 was on a closed-off farm track, in Podocarp-tawa forest, on ancient sand hills. Colony 2, 50m away, was on the side of a low ridge in the same bush. Notice its notched dorsal sepal (Fig. 1) and, what caught our attention mostly, the swept back bib to the labellum on mature flowers.

It raised tantalising memories of a Bridal Veil Falls denizen of Allan Ducker's on 30 Sept 1995; spotted again in a "quick" diversion from a nearby motor rally on 4 Aug 1997. Graham Marshall, the dedicated rallyist, seemed a bit agitated about the trials we were missing whilst the Column, efficiently as ever (?), photographed these odd, late flowering *Corybas trilobus* agg. Priorities do have to be maintained, don't they? Slides were filed uneasily under *C. "triju"*—then later under *Nematoceras "pygmy"* so the taxon went unreported these eight years. Now these pics came under close scrutiny and the Column chose to follow his own advice, *don't try to squeeze them into a taxon where they don't fit!* They were too big and flowered far too late to be *N. "pygmy"*, nor were they *N. "trijuly"* nor "tridodd". Yet another vexed *N. triloba* taxon?

More evidence was needed, so on 14 Aug 2003 at the Bridal Veil Falls (dropping into a basalt crater near Raglan) Phil Mitchell was duly impressed with a good showing of flower on, can we call it *N. "tribrive"*? (*triloba*, Bridal Veil Falls, Fig. 2). But Phil had spotted some *N. triloba* agg. during a tramp in the Hunua Ranges. So next day, some 3km from Lilburnes Road he indicated more of the same—*N. "tribrive"*. It is scattered along the Pukapuka Track, 94km from home, on a

greywacke ridge, above the 440m mark where, no doubt, the added rainfall and higher humidity brought conditions closer to the spray zone around 55m Bridal Veil Falls.

This is the seventh and highest altitude *N. triloba* taxon recorded in the Hunuas where *N. triloba* is quite uncommon: which is good in a way, because there is so little chance of hybrids when colonies are kilometres apart. *N. "tribrive"* is recognisable from the dorsal sepal sloping down at 45° to the tip, almost parallel with the rearward-sloping ovary, the labellum cleft is closed for the bottom half and the sheathing bract is well below the node.

When the Column compared slides of *N. "pygmy"*, "trijuly", "tridodd" and "tribrive" a figurative fog set in of similarities yet notable differences. New slides of *N. "pygmy"* from Geoff Stacey's Wharekawa garden (17 June 2003) and of *N. "trijuly"* (Fig. 3) from Tricia Aspin's find at Awhitu Central (5 July 2003), far from clearing the air, only added to the fog. To begin with, minor nagging differences in *N. "pygmy"* itself needed sorting before any analysis of the new ones could begin. Below is what is still emerging.

From Journal articles, the Column's personal records and personal communications with finders, all *N. "pygmy"*s, flower from the end of May to the middle of July, from Bream Tail [J76:38] to Queenstown [Nwsltrs 22:2; 28:11]. They have the node at the mouth of the sheathing bract and the dorsal sepal overhangs the labellum a little. Forms 1, 4 & 5 (detailed below), grow numerous, larger but sterile leaves in August. Do forms 2 & 3 do the same? Beyond that there are obvious differences and the 5 or 6 forms below emerge from the Column's deliberations: what do you think?

1. Dan Hatch's 1959 description of *Corybas trilobus* in *Auckland's orchids* [also Nwsltr 7:3] was in fact the Waitakere Ranges form of, can we now call it *Nematoceras "pygmy"* form 1? (Fig. 4). It has leaf and flower spread apart, has a flat leaf from early bud and the labellum cleft is wide below like an angular open U. It grows in

tight colonies from Matakawau to Wharekawa to Bream Tail to the Waitakeres. The Column's tag, *Corybas* "triju" [J76:39 fig. 6] was dropped because form 4 below was tagged earlier and *C.* "triju" also included *Nematoceras* "trijuly"! 2. Allan Ducker spotted the *N.* "pygmy" form 2 (Fig. 5) in some mossy kanuka on stream flats between Mangawhai and Bream Tail Reserve. It has a contoured V form leaf, tilting away from the flower and an oval opening to the labellum. Plants are solitary, 500mm or more apart but more data is needed on this one.

3. Geoff Stacey first picked up *N.* "pygmy" form 3 (Fig. 6) at Matingarahi just north of his Wharekawa Garden. It is the smallest of the lot. The notched labellum with a simple V cleft, sits right on the leaf, right into mid July and it grows in tight colonies. This form is also at Matakawau reserve.

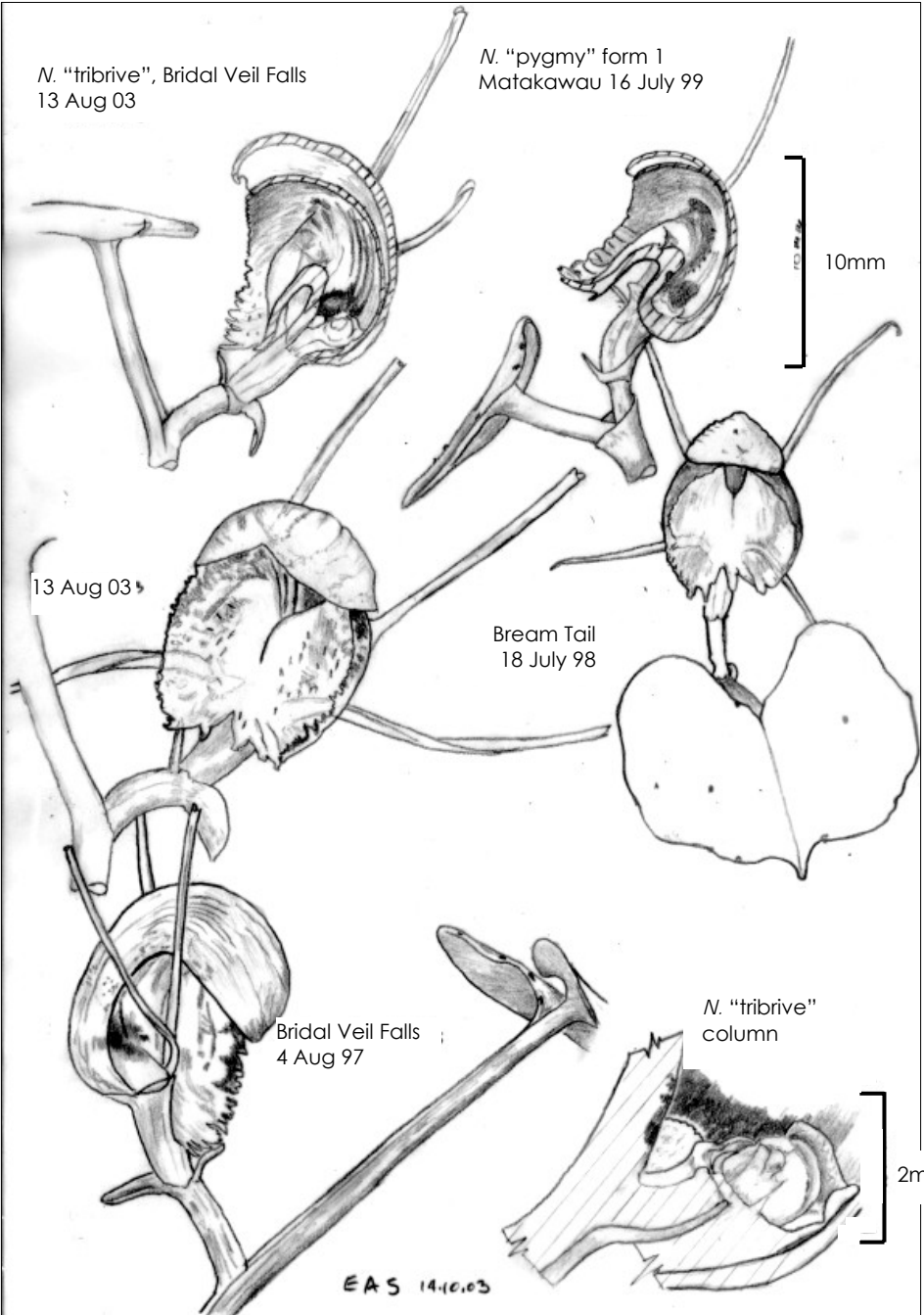
4. Graeme Jane and Gael Donaghy spotted *N.* "pygmy" and first tagged it at Cape Farewell [J69:11; J73:11-13], budding from a vertically coiled leaf but with a flared labellum, unnotched bib in J73:12 but notched in J69:11 and cleft closed at the bottom. N.B, bold page references are

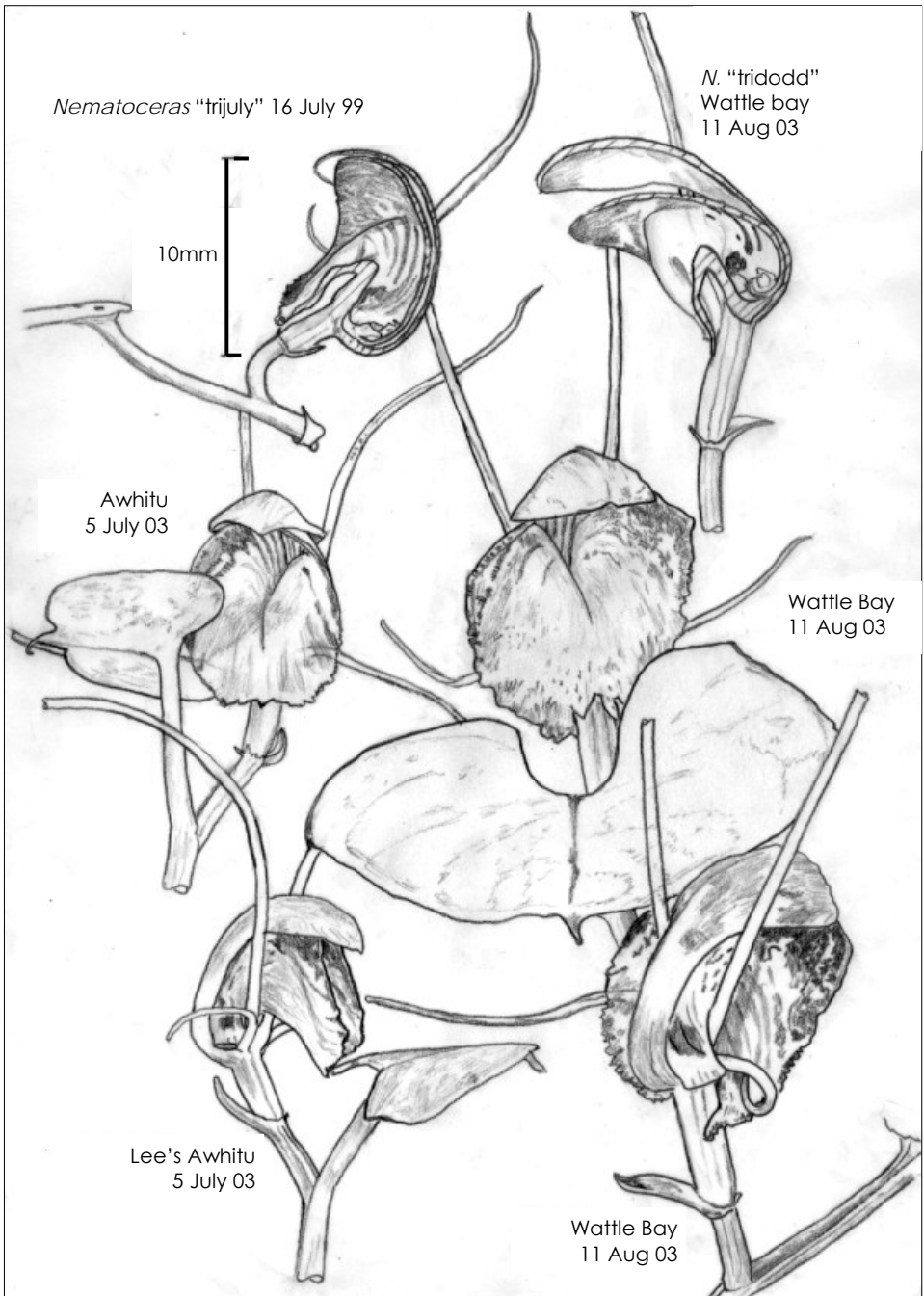
illustrated. It looks very much like Ian St George's from Five Mile Creek, Queenstown, p. 28 this issue. Compare it with Gael Donaghy's shot in J69:11. N.B, bold page references are illustrated. 5. Meanwhile, Brian Tyler and Geoff Monk (J84:36 and J88:25) have spotted colonies near Levin in Waitarere Pine Forest sand dunes (famed for *Chiloglottis trapeziformis*) along with the first alba form recorded for *N.* "pygmy". These open from a cupped leaf, have the angular U cleft of form 1 in a notched labellum and at first, sit on the leaf as in form 3 but petiole and peduncle lengthen as the flower matures to look much the same as form 2; hence its separation here into form 5. Is all that clear? The alba form with only faint tinges of pink, looks much the same, structurally and is producing seed capsules this season whereas the normally coloured red one isn't. If the alba seed is viable, this would doubtless be form 6.

To winkle out all the differences between *N.* "pygmy" and the other three from his slides, the Column first described one candidate taxon in close detail on the word processor then used a copy of it as a model for

Table: Recognition factors (P = present; x = absent)

Character	pygmy	trijuly	tridodd	tribrive
Flowering time ER 9-12	June/July	July	August	Aug/Sep
Climate	dryish	dryish	dryish	humid
Notched dorsal sepal	x	x	P	P
Entire dorsal sepal	P	x	x	x
Pointed dorsal sepal	x	P	x	x
Dorsal sepal end slope	usu. +10°	+10° to -10°	0° to +10°	- 45°
Lip cleft simple V	varies	P	P	x
Lip cleft closed below	varies	x	x	P
Bib notch & apiculus	small to 0	small	large	large
Bib curls back	x	x	P	a little
Bib curls forward	on some	a little	x	a little
Bib, many short hairs	on some	x	P	P
Sheathing bract position	at node	below	below	below





describing the next. Every character thus went through the sieve of close comparison. By the time all 4 tag-named taxa had been through this process, the figurative fog had mostly cleared.

The Editor wanted more than a brief write-up with some colour pics for any putative new taxa, so scale factors on slides were calculated from camera settings. Old Bridal Veil Falls shots with no settings recorded had flowers matched in size with recent shots. From back-projected images, drawings outlined to the same scale, revealed the notable differences in flower size. They were also enough to clear the "fog" for the Column; but what about you the reader? The drawings also highlighted in *N.* "trijuly" the labellum bib tight against the ovary in the Matakawau specimen yet standing well clear in Barry Lee's kauri bush at Awhitu Central; it's still the same taxon though, isn't it?

Sid Smithies tantalised the Column on 17 Sept 2003 with a cut-away pic of *N.* "tribaldy" from Otatau, showing its minuscule column in some detail. The Column had to mock-up a 3-D microscope from two 20 x lenses and two slides of a cut-away *N.* "tribrive" to complete the column sketch herein. He wasn't about to be beaten by a digi camera! Whatever next? Back projection is okay for the outlines but for details, close examination of the 3-D slides was needed. The two pollinia appear jammed against an inadequate looking rostellum with the anther cap behind and a two winged post anther lobe behind that. The stigma, like a half

cup, very close to the pollinia, suffered from surgery from the razor blade but this serves to show the tube leading to the ovary. Incidentally, tribrive's column is different from both the *N.* "tribaldy" one and the Editor's illustration in J28:11 for the Queenstown *N.* "pygmy" form 1 (?). Subminiature column detail does not appeal for field ID of *N. triloba* agg. but with a dissection microscope or macrophotography, identifying characters can easily be discerned in the columns. Do please have a look at the table and the illustrations. Have you any of these at other locations? Any information would be gladly swooped upon.

Figures on pages 25 & 26 →

1. *Nematoceras* "tridodd" Wattle Bay, 11 Aug 2003; notched dorsal sepal; simple V cleft to labellum
2. *N.* "tribrive" Bridal Veil Falls, 4 Aug 1997, typical "looking down" attitude.
3. *N.* "trijuly" Awhitu, 5 July 2003, pointed dorsal sepal and vestigial notch to the labellum.
4. *N.* "pygmy" form 1, Matakawau, 16 July 1999, commonest in ER 9, sheathing bract at the node.
5. *N.* "pygmy" type 2, Mangawhai, 17 July 1999, solitary plants, oval labellum opening.
6. *N.* "pygmy" type 3, Wharekawa, 16 July 1999, smallest, labellum sits on the leaf into maturity.
7. *Molloybas cryptanthus* "alba" at Omoana, 1993 photo by IStG.



***Nematoceras*
aff. *trilobus*,**

Five Mile Creek,
Queenstown,
July 1984,
(photo IStG).







IWITAHU NATIVE ORCHID WEEKEND ANNUAL CAMP 12-14 December 2003

All native orchid enthusiasts are very welcome to come along to the reserve to socialise, view the orchids, help with "hunting", surveying and plotting the orchid species and showing slides and photos in the evenings. Trevor is leaving Godzone and he will be sorely missed, so come along and support the Iwitihi Management group if you can. Bring your own bedding, warm clothes, teatowel, field guides, food and drink (including potluck dishes for the Saturday evening meal). Accommodation costs \$20. For bookings or further information, please contact Sue or Robbie Graham, ph: 07 377 0469, sue@wildwoodgallery.co.nz

NEW ZEALAND NATIVE ORCHID GROUP First Annual General Meeting

7 pm on Saturday 13 December 2003
At Iwitihi Camp hall.

AGENDA

1. Present
2. pologies
3. Discussion of the proposal
"Should the NZNOG become an incorporated society: NZNOG Inc?"
4. If the proposal is agreed
 - Election of convenor
 - Election of executive
 - Approval of rules (see J88)
 - Date and place of AGM
 - Date of financial year
 - Signing application
5. Other business
 - the new classification
 - email journal
 - other
6. Close.

Darwin on God — and von Mueller on Evolution

Mueller's *Chatham Island plants* (in which he described *Pterostylis banksii* var. *silvicultrix*) was published in 1864 when its author was 39: I recently found a copy: its introduction is a fine example of the over-decorated prose of Victorian times.

Ferdinand von Mueller was born at Rostock, Germany. He studied pharmacy and took his Doctor of Philosophy at the University of Kiel in 1847. He came to Australia in 1848 for health reasons and became a great botanical collector and writer. He was Victorian Government Botanist from 1853, and for a time Director of the Botanic Gardens. He supported botanical exploration and collecting throughout the colonies. His botanical publications are very extensive. Dr Mueller received honours from many of the ruling Royal Houses of Europe, was made a Baron by the King of Wurtemberg in 1871, and was knighted by Queen Victoria.

Charles Darwin was born in Shrewsbury, England. Five years before Mueller's book was published, and when Darwin was 50, his book *Origin of species* appeared (though he had been working on his theories of natural selection for 22 years). *Origin* was an immediate publishing success, selling out the first day it was in print. It was also the immediate source of great controversy.

Darwin was depicted as an antichrist, and indeed he later wrote, "*By ... reflecting that the clearest evidence would be requisite to make any sane man believe in the miracles by which Christianity is supported, - that the more we know of the fixed laws of nature the more incredible do miracles become, - that the men at that time were ignorant and credulous to a degree almost incomprehensible by us, - that the Gospels cannot be proved to have been written simultaneous with the events, - that they differ in many important details, far too important as it seemed to me to be admitted as the usual inaccuracies of eyewitnesses; - by such reflections as these, which I give not as having the least novelty or value, but as they influenced me, I gradually came to disbelieve in Christianity as a divine revelation. The fact that many false religions have spread over large*



Mueller



Darwin

portions of the earth like wild-fire had some weight on me. Beautiful as is the morality of the New Testament, it can hardly be denied that its perfection depends in part on the interpretation which we now put on metaphors and allegories”.

One thinks of the opposition to the evolutionary theories of natural selection as arising only from the Church – from nonscientists - but in fact it was ubiquitous.

There is, for instance, a passage in Mueller’s introduction that can only have been intended as a direct rebuff to Darwin’s theories, “... the writer has never been led to assume, that limitation of species is hopeless, or that an uninterrupted chain of graduations absolutely connects the forms of the living creation. Analytical dissections ... have never left such impressions on his mind; but on the contrary convinced him of the great truth, that the

Supreme power to which the universe owes its existence, called purposely forth these wonderful and specifically ever unalterable structures of symmetry and perfection, structures in which a transit to other species would destroy the beautiful harmony of their organisation, and would annihilate their power to perform those functions specially allotted to each in this great world from the morn of creation to the end of this epoch”.

Mueller was, at least at that time, a creationist. I wonder if he changed his views; his surviving letters have been published recently (he is said to have written over 300,000 in his lifetime!).

It took several years, but eventually the scientific community began to rally behind Darwin, and now, ironically, he is himself almost regarded as a deity, or at least with almost reverent adoration.

PTEROSTYLIS BANKSII.

R. Brown, accord. to All. Cunn. in Bot. Mag. t. 3172; All. Cunn. in Hook. Compan. to the Bot. Mag. ii. 376; Lindl. Gener. et Species Orchid. 388; J. Hook. Fl. Nov. Zeel. i. 248.

On grassy places of Chatham-Island.

The plants of Mr. Travers’s collection are unusually dwarf, some only a finger’s length.

Varietas silvicultrix.

Chatham-Island, in woods only.

The characters of this variety consist in broader and shorter leaves, which are verging from broad-ovate into lanceolate, only 1-2½” long, but 2/3-1” broad and acute but not acuminate, in proportionately broader sepals, of which the inner are lanceolate and simply acute, whilst the outer are hardly or little longer than these and never so much protracted into a narrow acumen as those of the typical form of *Pterostylis Banksii*. The author however has been unable to detect any important structural differences between these plants and has therefore not ventured to separate them as species, although middle-forms are missing in the collection. New Zealand specimens of *P. Banksii*

Mueller’s *Pterostylis banksii* var. *silvicultrix* is now *Pterostylis silvicultrix* (F. Muell.) Molloy, DL Jones & MA Clem.—*Ed.*

Bob Goodger of Tauranga died on 9 August. Bob was a keenly observant New Zealand native orchid enthusiast and expert photographer. For many issues his photographic art graced the back covers of *Orchids in New Zealand*, and he has left a legacy of beautiful macrophotography in the *NZ Native Orchid Journal* and other publications, and with the Orchid Society of NZ. We extend our sympathy to Beryl. Bruce Irwin has written a tribute (see *Original papers*, this issue).



A contributor to a native orchid chat group wrote, "I was recently at a site in Central New York State (USA) that is supposed to have *Platanthera orbiculata* and/or *P. macrophylla*. They have been described to me as species that will often have leaves, but don't flower except every so often. Now is the time when the flowering is supposed to be at its peak, but after finding around 30 or more plants in a few acres area, no flower spikes have been found. Is it possible that a whole group may avoid flowering, or is it possible that a very cool spring with a deep snow cover over the winter would radically delay the flowering time? I know that many other **terrestrial orchids will hide underground** for many years, others have leaves but not flowers. The leaves I have found range from medium/small to very large, so it doesn't seem that health and age have anything to do with them not flowering. Some of the leaves are very healthy looking".

Another added, "I monitor *Platanthera psycodes* here in the southern edge of its range in northern Illinois. Seven years ago there were almost a hundred plants between the two different sites I monitor. Last year, after we had three summers of drought, there were two plants per site. This year, a very rainy year

overall, there was only one plant on one site and that had been eaten by a deer. If anyone can help me figure out some strategies for not losing these populations entirely in these sites, I would greatly appreciate it. Or - do you think they are just gone, since there were no reproductives this year?"

From the US, "Warren Stoutamire and others have observed that many terrestrial species can spend a lot of time underground, perhaps in a saprophytic state and then appear again. Professor Gill at University of Maryland carefully observed *Cypripedium acaule* being 'dormant' for many years before reappearing. *Platanthera leucophaea* may exist in many early seedling stages for years before making an appearance. It is possible that 'they aren't dead, only sleeping'".

And, "I too tend to be optimistic - with 100 flowering plants seven years ago (i.e. in 1996) and a few plants still flowering after three summers of drought, more plants surely have survived underground. With this year's rain, the coming years probably will show reduced, but not eradicated populations".

And, "I think you have many dormant plants that remained underground to build up their reserves. The next few years will give you the answer so keep up hope".

And, from the original contributor, "I earnestly hope that the population is not lost, too! As far as I know, the last data collection took place eight years ago, before I and my monitoring partner went out there last year to survey the sites and look for plants. Because it is such sensitive habitat, we did not trample everywhere, but focused our attention on the area where they had been found previously. I am

wondering whether the deer eating the one plant will have killed it or whether there was possibility of it coming back next year”.

And finally, from UK, “I don’t have much knowledge about USA *Platantheras*, but it is possible that they may respond to drought in a similar way to our Bee Orchids. If you want to see some information on the response of Bee Orchids please look at our website (<http://fp.orchidmagic.f9.co.uk>) - in the Favourites section click on the thumbnail on the left of the top row.”

“The height of the Bee orchid varies from about 7-70cm and the number of flowers per stem from 2 to more than 12. Mowing or grazing of stems before seed production usually results in more buds the following year. The sepals are typically 10-20mm long and the leaves, which persist until after flowering in June/July (given enough water), appear above ground in September/October in England; the leaf rosette is close to the ground. November is usually the easiest time to find Bee orchid plants as the leaves have a distinctive silvery green colour. In cultivation, given access to fertiliser and lower light levels, the leaves become a deeper green and lose much of their silvery appearance. It produces one to three new tubers each year, if it does not become too dry during flowering. If it aborts its flowers and sets no seed it is a clear sign that it has been too dry and that it will not have formed a significant replacement tuber. It is believed that if it becomes too dry it can form tiny tubers at or near the ends of its roots and that these then take a number of years to reach flowering size. When raised from seed, with or without fungus, it is possible for Bee orchids to reach flowering size in 2 years, in nature, with less than ideal conditions, it may take many years, depending upon water supply. Plants that are watered during droughts flower every year with a large number of flowers per spike and can produce more than one tuber per year. Although the tuber is regarded primarily as a food store by many people, in a wet autumn the tuber can become very large (3 x 4 cm or more), even

though a tuber smaller than 1 x 1.5 cm can produce flowers. This suggests that the tuber may be storing large quantities of water whenever possible. I have transplanted a number of Bee orchids from threatened locations to safe ones (with the appropriate permissions) and I have not seen any evidence for deep roots like those found in *Dactylorhizas*, or even any roots that penetrate below the bottom of the tuber. The spread of the roots is usually very small, only a few times the diameter of a large tuber. The combination of lack of water during flowering and the tiny root system is probably responsible for the belief in England that Bee orchids are short-lived (or only flower once) and are prone to disappear and reappear randomly.

“The following is quoted verbatim from an email that I received, ‘The problem with *O. apifera* is that it is actually polycarpic, not monocarpic as was previously thought. This means that the same tuber can lie dormant up to a number of years and then flower, giving the casual observer the impression that it is a first year coloniser. The seeds may have germinated years ago but development halted as it entered the dormant phase. The population dynamics of this plant are erratic and require a long term study to fully understand (20+ years). My research did involve an area of industrial land with this species (now developed) and only 6 were found in the 1st year while in the following year over 40 were seen. This species favours this type of habitat, since competition is low. But do not be alarmed if few appear next year, as was previously explained, this is a result of dormancy, induced by stress of reproduction, herbivory and/or climate. But consideration should be made for changing associated species assemblage through time (succession)’.

“I am not sure if true dormancy takes place, or if replacement tubers are made each year, or even if a combination of these things plus the earlier suggestion of mini-tubers. There is still much to learn about this species.”

Even in northern Europe the extended la Niña phenomenon created an **extreme summer**; a Scandinavian correspondent to NativeOrchids@yahoo.com wrote, "Again it has been a great summer although many orchids were small, perhaps because of a very cold winter. I travelled in Estonia (for example *Dactylorhiza ruthei*, *D. praetermissa*, *Cephalanthera rubra*, *Anacamptis pyramidalis*, plenty of *Dac.* hybrids, many other exciting species), and in Finland in the following places: in Oulanka national park in bloom *Calypso bulbosa*, *Listera cordata* & many others not blooming; in Dragsfjärd coast the only Finnish *D. baltica*, not yet blooming in late June; in Savonlinna *Calypso bulbosa* was the most important one, also many others. These are the most important ones. I still should go and photo *Epipogiums* this week".

Reply: "... last Sunday I visited a site where this orchid is to be found almost every year and so also this day but it was already fading. So do not wait too long until you go to your site. I guess that the very warm summer and here in the southern part of Sweden even enough rain has given an early flowering time for *Epipogium*".

Reply: "I went to see the *Epipogiums* today (8 August), but in this area, the soil was quite dry, and besides dryness there was also some trees cut down in past few years. So even with a guide I was unable to find it (my guide had seen it in these same places, on 9 August some 5 years ago, lots of specimens and it is known to bloom in this area regularly, almost every year). I will go back in some other year with more moisture. Its been very dry: while I drove back home from my trip, I was able to see small woods of *Alnus* that had totally lost their leaves, even many birches (*Betula*) had nearly no leaves left... and there is almost no mushrooms. This is one of those years when *Epipogium* should not be tried to find. My teacher didn't find it from her cabin's woods, and one scientist who knows a place with more than 100 *Epipogiums* saw only 7

An Invitation to join "Friends of Iwitahi"

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For further info contact:

Robbie & Sue Graham

ph: 07 377 0469,

sue@wildwoodgallery.co.nz

plants this year. I have been lucky enough to see this plant last year. It was much earlier, in mid-July, and many plants had ended blooming (actually one specimen was not open yet, but most were good".

(The European *Epipogium aphyllum* is, as are our *Gastrodia*, an achlorophyllous leafless ground orchid – it is called the “Ghost orchid” in UK because it is so pale, so fleeting in its appearance, and so hard to find—Ed.)

The resolute Dame Ella Campbell...

(From
Massey News
8 August,
2003)

One of the University's most illustrious daughters was farewellled last week.

Renowned botanist Dame Ella Campbell

died in Palmerston North on 24 July at the age of 93. She was the University's first woman staff member and the only woman staff member for many years. She joined Massey in March 1945, lecturing horticulture and agriculture students about plant morphology and anatomy. Her primary interest was the study of liverworts. Her vast collection of the species is held at the University's herbarium, named the Dame Ella Campbell Herbarium in a ceremony earlier this year, attended by Dame Ella.

Dame Ella travelled widely overseas in pursuit of liverworts and also became an internationally accredited orchid judge. She was multi-lingual, and once delivered a speech in German at the 300th anniversary of the Berlin Botanical gardens. She remained on the teaching staff of the University until her 'retirement' in 1976 but continued to work as a research associate in the Ecology building for more than two decades, publishing a



substantial volume of work before finally retiring at age 90. She was awarded a DSc from the University of Otago and Fellowship of the Royal New Zealand Institute of Horticulture in 1976. She became a Dame Companion of the New Zealand Order of Merit in 1997, as “a pioneer in the field of university botanic research,” and received the Massey Medal in 1992.

Ella Campbell wrote five papers on the mycorrhizal associations of New Zealand's achlorophyllous mycotrophic terrestrial orchids, Gastrodia cunninghamii, G. aff. sesamoides, G. minor, Molloybas cryptanthus and Danhatchia australis. This work was very highly regarded internationally—Ed.

Don't eat orchid tubers! A large population of *Epipactis atropurpureum* on 40-year-old zinc wastes in Chrzanow, southern Poland, where the soil contained high concentrations of cadmium, lead and zinc, was studied for heavy metal content and mycorrhizal development. Rhizomes of the orchid contained extremely high levels of these heavy metals, and the copper content was five times higher than that found in the soil. Heavy metal contents in rhizomes were 10 times (zinc) to 100 times (lead, cadmium) higher than in the shoots. These results suggested the accumulation and biofiltering of metals within rhizomes. But how?

E. atropurpureum almost always has mycorrhizal roots: the fungus penetrates the rhizome forming complex hyphal coils. Most of the toxic elements had accumulated in the fungal coils in the rhizomes: lead, iron, zinc, calcium, sulphur and aluminium were in much higher concentrations in the fungal coils than in the surrounding cells. Mycorrhizal fungi may play an important role in heavy metal sequestration and detoxification, allowing the plant to survive in extremely polluted places.

— J. Mesjasz-Przybyłowicz, W.J. Przybyłowicz, B. Godzik, K. Turnau. 37th Microscopy Society of South Africa Conference, Johannesburg, 2–4 December 1998. Proceedings – Vol.28, p. 64.

You can buy an “authoritative interactive CD-ROM called *Orchidopaedia*, which is an illustrated reference guide for the professional and amateur grower, with the equivalent of more than 1000 pages of text and more than 550 colour images, with links to important resource material world-wide. We can fill orders directly from our site at <<http://www.ipoz.biz/store/orders.htm>> and can supply it postage paid to NZ for AU\$90 or NZ\$103”.

The oriental herb “Gastrodia

Tuber” (*Rhizoma Gastrodiae*) is found in Sichuan, Yunnan and Guizhou provinces, China. It tastes sweet, has neutral properties, and is said to have the following medicinal effects: “Relieves convulsion, clams the liver (*I think that should be ‘calms’* -

Ed.) and relieves pain. Use in infantile convulsion (with *Uncaria* stem, antelope’s horn and scorpion), headache and light-headedness (with *Uncaria* stem, *Scutellaria* root and *Achyranthes* root), chronic headache and recurrent migraine (with *Chuanxiong* rhizome). Dosage & administration: 3-10g (boiled in water for oral use).

Dr Subhuti Dharmanand PhD, Director of the Institute for Traditional Medicine in Portland, Oregon wrote in 1998:

Gastrodia refers to the tuber of an orchid, *Gastrodia elata*. This plant has an unusual requirement for survival: it must have the *Armillaria mellea* mushroom mycelia incorporated into the tuber in order to maintain its maturation and growth, and it requires another fungus, *Mycena osmundicola*, to sprout the seeds. When supplies of the crude gastrodia became rare in the 1970s, attempts at cultivating the herb repeatedly failed until this complex synergistic plant/mushroom relationship was determined. Then, cultivation became easy,

though it was not until the late 1980s that an adequate cultivated supply of gastrodia was developed.

Interestingly, the medicinal benefits of gastrodia were found to be mainly the metabolites of the *Armillaria* mushroom. In other words, if one could grow the mushroom, the gastrodia tuber could be dispensed with and one could use just the mushroom material in place of gastrodia. This mushroom cultivation (by batch fermentation) was accomplished and the material was tested in the 1970s; today gastrodia mushroom (*Armillaria*) is frequently used instead of cultivated gastrodia. In the meantime, wild gastrodia, along with all other wild orchids, has been put on the endangered species list.

Gastrodia was listed in the ancient Shennong Bencao Jing (*ca.* 100 A.D.) and was later classified by Tao Hong as a superior herb, meaning that it could be taken for a long time to protect the health and prolong life (as well as treating illnesses). It was originally called *chiqian*, meaning red arrow, because of its red stem shaped like an arrow. Later it was named *tianma*, or heavenly hemp (*ma*, usually translated as hemp, refers to many plants that have fibrous stems, such as the well-known *mahuang*).

The traditional use of gastrodia is to calm internal wind and dispel invading wind, and invigorate circulation in the meridians; thereby treating headache, dizziness, vertigo, convulsions, paralysis, and arthralgia. In the book *Chinese English Manual of Commonly-Used Herbs in Traditional Chinese Medicine*, the three basic indications are reduced to this elaborated pair: Calm the liver wind: For syndrome of liver-wind stirring inside, such as infantile convulsion, tetanus, epilepsy, as well as dizziness and headache due to excess of liver yang or the attack of wind-phlegm; recently it is also used for treatment of neurasthenia, nervous headache, and hypertension; expel wind evil and alleviate pain: for migraine, arthralgia due to wind-dampness, numbness of extremities, and general fatigue.



According to research reports, the main active ingredients include gastrodin, a complex glycoside, plus vanillyl alcohol and vanillin, which, as their names suggest, are related to the flavor vanilla (vanilla comes from the fruit of another orchid, *Vanilla planifolia*, and the primary flavor is vanillin, which is synthetically produced as the standard flavor substitute). Vanillin has been shown to have anticonvulsive effects. There have been numerous other compounds identified in both *Armillaria* and the gastrodia tuber, with roles that are not yet established.

The gastrodia mushroom, *Armillaria* (also listed as *Armillariella*), is known in China as tianma mihuanjun. Like many other medicinal mushrooms, *Armillaria* contains immune-enhancing polysaccharides, but the amount of the gastrodia mushroom usually ingested is not sufficient to provide a substantial immune-enhancing action. Gram for gram, the armillaria mushroom is more potent than the gastrodia tuber, mainly because it is the primary source of the active constituents. An exact quantitative comparison has not been determined, and may vary with the different therapeutic applications, but, generally speaking, the dosage of armillaria to be used is about half that of gastrodia tuber.

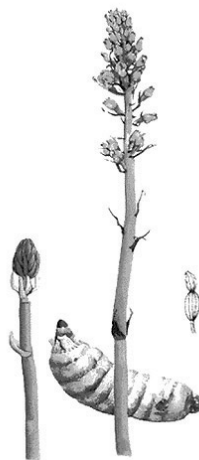
Because these products are safe to use, armillaria can be used in the same amount as the gastrodia rhizome it replaces in order to attain superior effects. Gastrodia tuber is traditionally given in decoction in doses of 3-10 grams per day; the gastrodia mushroom (fermentation product) or gastrodia tuber is given in the form of a powder in doses of 1.0-1.5 each time, 2-3 times per day (total dosage of 2.0-4.5 grams/day).

According to *Icones of Medicinal Fungi*, *Armillaria* fermentation products “are found to produce satisfactory effect in treatment of dizziness caused by hypertension, insufficient blood supply to the arteries’ cone base, Meniere’s syndrome, as well as functional disorders in autonomic nervous system. They are also effective in improving numbed limbs, insomnia, tinnitus, epilepsy, vascular headache, and apoplectic sequela (post-stroke syndrome).”

The *Advanced Textbook on Traditional Chinese Medicine and Pharmacology* mentions that “This herb is mild, and can subdue hyperactive liver yang,

eliminate wind, and remove obstruction in the collaterals, and is indicated for all kinds of wind syndromes, either cold or heat type or due to internal or external wind. For such cases, it is combined with other herbs according to the specific conditions. It is an important herb to treat dizziness.” Examples of combining gastrodia with other herbs include these, from the *Textbook*: For dizziness and headache due to hyperactive liver yang, combine with uncaria and haliotis. For upward disturbance of wind-phlegm, combine with pinellia and atracylodes. For migraine, combine with cnidium. For convulsion due to irritation by liver wind, combine with antelope horn and uncaria. For tetanus (tonic convulsion, a wind-phlegm disorder due to external wind) combine with arisaema and siler. To relieve wind and remove obstruction in the collaterals (luo vessels), producing rheumatic pain and numbness of the limbs, combine with chin-chiu, chiang-huo, and achyranthes.

... and they say doctors talk mumbo-jumbo – Ed.



Gastrodia elata

A personal tribute to Bob Goodger

By Bruce Irwin, Tauranga

Native Orchid Group members will regret the death on 9 August 2003 of Bob Goodger, who together with his wife Beryl, took a very active interest in studying and photographing New Zealand native orchids. Bob was a man of many parts. His interests included harriers, coaching athletics, painting, woodcarving and participating in Search and Rescue; but to me his skill as a photographer and his familiarity with local native orchids stood out.

I shared many of the Goodgers' orchid excursions. In 1983 Bob showed me a sketch he had made of a most curious *Pterostylis*; so curious in fact that I thought Bob had lost control over his pencil. The Goodgers both assured me that the dozen or so flowers they had seen were all very similar, so it was unlikely they were freaks. A small expedition with Bob and Beryl to Ohakune in November 1984 proved that the plants existed and that Bob's drawing was

indeed accurate. Having established that the strange *Pterostylis* existed, there seemed no need to rush things. In any case there were other orchids, closer to Tauranga, demanding our attention.

Several years passed before we returned to the site. But where was the colony? A few *P. aff. montana* were evident but the mystery *Pterostylis* had vanished: so too had the small depression they had occupied. Debris from road widening must have been dumped on the main colony. Several times since, I have searched in the hope that seedlings might have survived, always without success. Also I rather expected to find flowers in other suitable habitats in the same general area. Perhaps Bob's mystery orchid will be rediscovered elsewhere in New Zealand. Whatever the circumstances, if it is found to be a valid species, I suggest that it be named "*Pterostylis goodgerii*". Bob deserves such recognition.

"*Pterostylis goodgerii*"

- drawings by Bruce Irwin.
Left to right:

- Labellum;
- Labellum & column
- Side and front views of flower
- Leaf.



Kauri orchids in the Kaimai ranges

By Graeme Jane, Tauranga.

Bruce Irwin first introduced us to the *Pterostylis agathicola* at the Springs Road Kauri Grove walk not long after we arrived in Tauranga. It is a fairly well established population quite handy to the road. Over the next couple of years we have found *P. agathicola* in most stands we have visited. In the Wairoa Stream even a search around two isolated kauri on the river flat (grid ref 27640 60064) yielded a few flowering plants each year.

So it was quite a surprise a few weeks ago to find *P. agathicola* forming quite a large population under *Pinus pinaster* in one of those stands that must have been planted after logging in the Ngamuwahine stream, some time in the 1920s or 1930s (grid ref 27729 63735). The *P. pinaster* forms a dense canopy. Beneath, there is a sparse understorey of mamaku (*Cyathea medullaris*) and a range of native shrubs such as privet (*Geniostoma ligustrifolium*) prickly mingimingi (*Cyathodes juniperina*) and karamu (*Coprosma robusta*).

As the photo shows the *P. agathicola* was arising from a dense litter of pine needles. So where was the kauri? Probably long gone. The site though, is a typical kauri site, on a ridge top facing north, somewhat stony soiled so perhaps it was there in the recent past. There are no kauri known from that general area today. The nearest that I know of are the southernmost accessible kauri on the other side of the range in Rapurapu Stream (grid ref 27665 63626) where we did not find *P. agathicola*. (We have yet to visit the site in Wairakau Scenic Reserve). On skiting to Bruce he assured us that this is not the southernmost site for *P. agathicola*. He found it on Roys Rd some 30 years ago - another hunt to relocate I suspect.

A couple of weeks later, on a Rotorua Botanical Society trip to a private land covenant, again *P. agathicola* was recorded from a site



lacking in kauri (grid ref 27649 64042).

This time though, kauri had been felled quite recently in the immediate vicinity (possibly less than 20 years ago) and the find was the result of a deliberate search (although we were beaten to the discovery by other Botsoccers).

Some of these sites have been visited several times in the hope of finding *P. brumalis* but to no avail. The only site that it has been recorded from is a substantial kauri stand in the Wairoa Stream (grid ref 2762564037). This is a young stand (perhaps 100 years old) with a dense understorey of kauri grass (*Astelia nervosa*) and the sweet scented *Alseuosmia macrophylla*. We have also eagerly sought *Cyrtostylis oblongus* and *Anzybas rotundifolius* but to no avail. The nearest site for these two we know of is Mt William Scenic Reserve (grid ref 2602 64408) near the foot of the Bombay Hills. But there is always hope.

A pickled *Prasophyllum*...

By Bruce Irwin, Tauranga

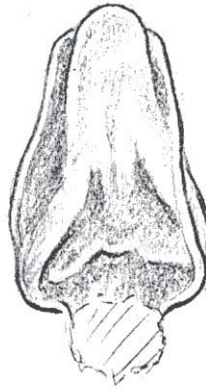
A couple of weeks ago I noticed a pickled *Prasophyllum ex Paranui* collected by Doug McCrae on 2 November 1987. They were so small they could be mistaken for *Genoplesium (Corunastylis)*. Coupled with the long time in pickle it was difficult to make satisfactory drawings. However, one flower yielded interesting information before it finally disintegrated.

Clearly it was not the plant I have always regarded as *P. colensoi* until David Jones published his resolution of the *Prasophyllum* complex. This plant doesn't fit Lucy Moore's description of *P. colensoi* nor Jones's description. It comes fairly close to Jones's description of *P. alpinum* (especially in size) except that the column appendages are very nearly as long as the anther whereas Jones says of *P. alpinum* they are much shorter. So much depends on the angle from which structures are viewed that this apparent difference may not be significant.

Apart from its smaller size, the plant also comes close to *Prasophyllum "A"*. Another reason to doubt that it is "A" is that "A" appears to be limited on Ruapehu to elevations above 1000 metres.

Bob Goodger gave me a photo some years ago which clearly showed that the one colony of *Prasophyllum* I know close to Tauranga is almost certainly the tall more elegant plant I call *Prasophyllum "B"*. It would be interesting to know whether the two taxa overlap. The Tauranga "B" is probably at about 200m altitude so may be widespread throughout NZ, up to about 1000m.

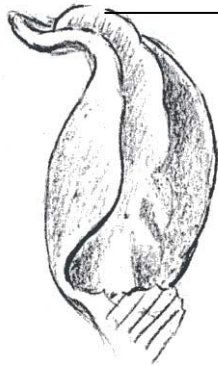
Rather like *Microtis*, *Prasophyllum*s don't appeal to many people. They lack the attractive blooms of other genera and seem determined to look as alike as possible.



Labellum

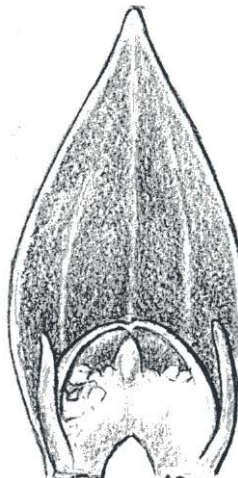
Tip curved under

Raised central callus



Central callus reaches almost to tip of labellum

Central callus below bend probably not accurate



Dorsal sepal

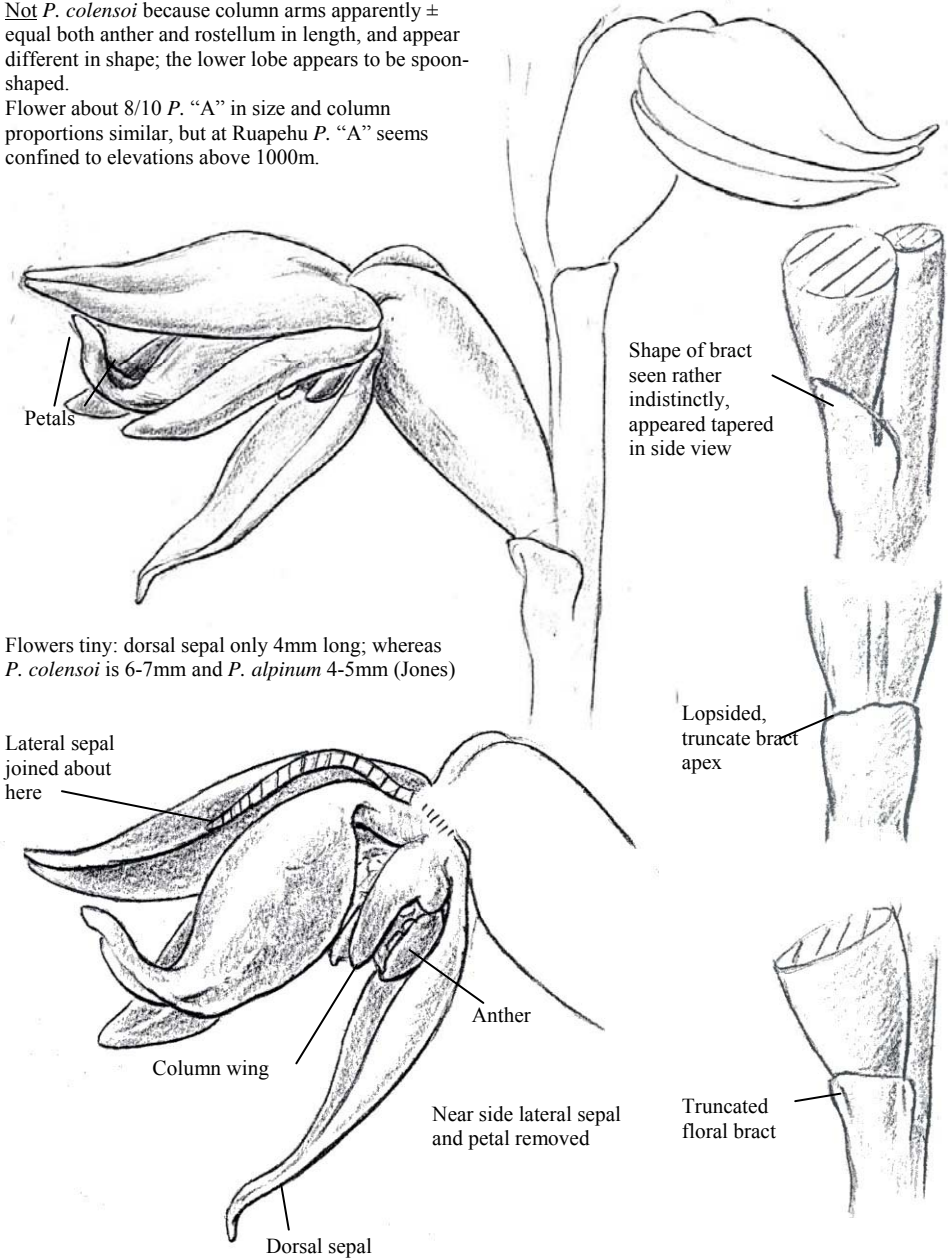
Slimmer than in *Prasophyllum "A"* or *P. colensoi*.

Dorsal sepal attached to circular anther.
Pollinia obscure.
Stigma and rostellum seem shorter than anther and equal to column wings.

Pickled *Prasophyllum* (sp?) Collected by Doug McCrae, Parauui, 2 Nov 98

Not *P. colensoi* because column arms apparently \pm equal both anther and rostellum in length, and appear different in shape; the lower lobe appears to be spoon-shaped.

Flower about 8/10 *P. "A"* in size and column proportions similar, but at Ruapehu *P. "A"* seems confined to elevations above 1000m.



Flowers tiny: dorsal sepal only 4mm long; whereas *P. colensoi* is 6-7mm and *P. alpinum* 4-5mm (Jones)

Michael Pratt wrote (1 October), "Just to let you all know my Native Orchids website can now be accessed via the address: www.nativeorchids.co.nz. It now gets a surprisingly large number of visitors from all over the world.

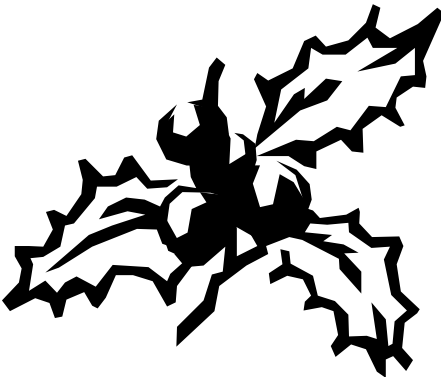
"I managed to get my mitts on some professional web making software, so I've spent some time over the winter evenings redesigning the layout to make it more user friendly. I've also added a few more features, which are

- Clicking on the photos in the photo section will now open a pop-up window with a description of the species and a larger photograph.
- I have added a 'Contributions' area where you can post any photos, news of your field trips, or articles for the world to read.
- I have also added a message board feature.

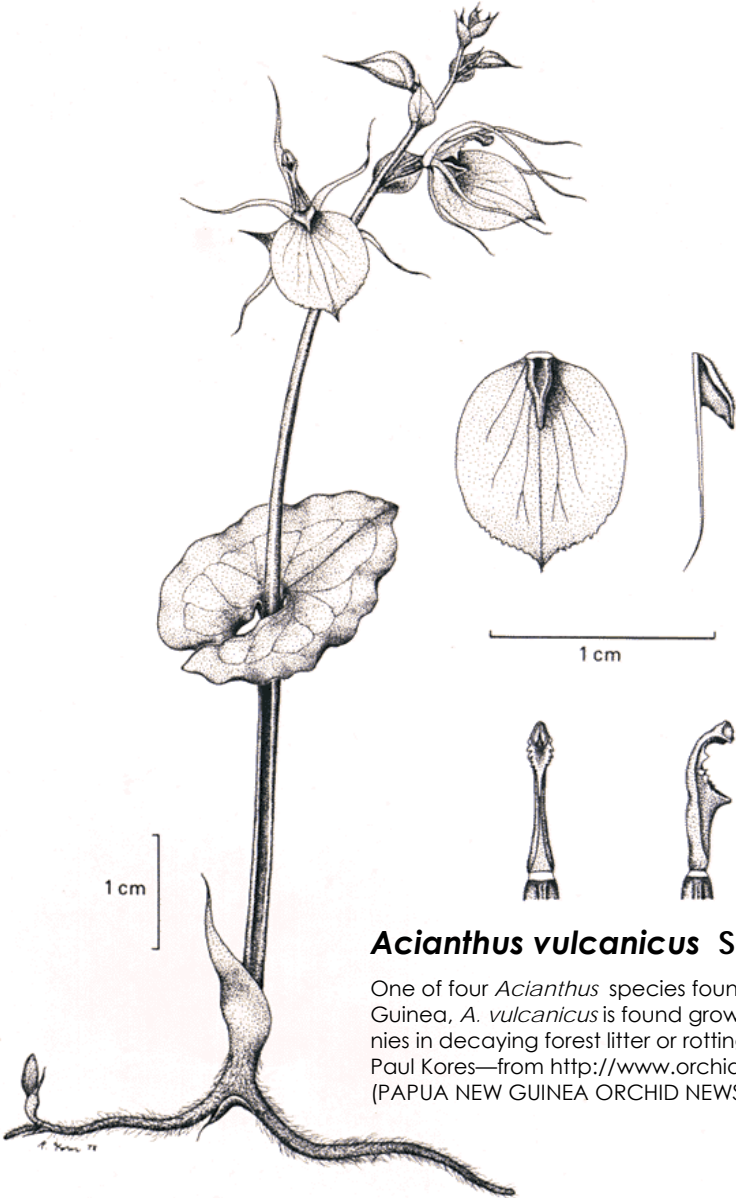
"At present there are not photos of all of the species, so if you have any good quality photos which I can use to fill in the gaps, please contact me. The easiest way to tell which species are missing is to go to the 'Checklist' page... the species that are not underlined are the species which lack photos.

"If you think I've made any mistakes, or there is something you would like to see added to the site, please let me know via email or the message board. Please contact me at: michael@nativeorchids.co.nz, or write to me at 389 Waikupa Road, RD12, Wanganui. Phone (06) 3424782."

If you haven't visited Michael's website you should look at it—it is superbly laid out, accurate and informative. The site will carry an electronic version of the Journal in future. Michael is open to suggestions for improvement, and he would be grateful if you were to tell him about any errors (as we editors always are)—Ed.



A happy and
safe Christmas
and festive
season to all



***Acianthus vulcanicus* Schodde**

One of four *Acianthus* species found in Papua New Guinea, *A. vulcanicus* is found growing in small colonies in decaying forest litter or rotting logs. Drawn by Paul Kores—from <http://www.orchidspng.com> (PAPUA NEW GUINEA ORCHID NEWS).

Understanding orchid names

by Brian Richards, from Kalhari, "The Message Stick" of A.N.O.S. (Qld) Kabi Group Inc.

Species

Orchids, like all living things, are given a scientific name that consists of at least two words (a binomial name). The language used is of Latin or Greek origin as this is the traditional language of science and is internationally understood.

The first word of the name is the genus (plural: genera) or generic name. It is a noun and is written in lower case letters with a capital initial letter and is underlined if written or italicised if printed. The second word is the specific epithet. It is an adjective, is written in lower case letters and also underlined if written or italicised if printed. Together the two words make the species name. Species is both singular and plural.

e.g. *Dendrobium tetragonum* is a species name consisting of the generic name (*Dendrobium*) and the specific epithet (*tetragonum*).

The generic name is a singular noun. When pluralised it becomes a common name and does not begin with a capital except to begin a sentence and is not italicised eg. cymbidiums, odontoglossums.

Subspecies, varieties and forms

Taxonomists may sometimes add other words onto the species name in a strict hierarchical order of rank. They are subspecific epithet (subsp.) varietal epithet (var.) and form epithet (f.).

e.g. *Dendrobium tetragonum* var. *giganteum* is a varietal name consisting of the generic name (*Dendrobium*), the specific epithet (*tetragonum*) and the varietal epithet (*giganteum*).

These epithets are in lower case letters and are underlined if written or italicised if printed. The terms subsp, var and f are not underlined or italicised.

Synonyms

A synonym is a name that has been rejected because another name has precedence or the plant has been reclassified.

e.g. *Dendrobium jonesii* (Syn *Dendrobium ruppinum*)

Hybrids

A hybrid can be defined as the progeny of a cross-fertilisation between plants with different genetic systems.

Natural hybrids

Natural hybrids are hybrids that have been discovered growing in the wild and have come about without the intervention of humans.

When two different species of the same genus hybridise the progeny are known as interspecific hybrids. Interspecific hybrid names can either be written as a formula ie the names of both parents with a cross in between.

e.g. *Dendrobium kingianum* x *Dendrobium speciosum*

or are given a collective epithet which is preceded by a "x"

e.g. *Dendrobium* x *delicatum* is a collective name consisting of the generic name (*Dendrobium*) and the collective epithet (*delicatum*).

In the case of intergeneric hybrids (the progeny of a cross-fertilisation between two plants of different genera) a new name is given. A "x" is placed in front of this name but is usually omitted in orchid literature.

e.g. *Aerides* x *Vanda* = *Aeridovanda*

Artificial hybrids

Artificial hybrids are hybrids that have resulted from the cross-pollination of flowers by humans. When cultivated orchids are hybridised the progeny are initially known by a formula. This consists of the names of both

parents with a “x” in between (the capsule parent is written first, the pollen parent second).

e.g. *Dendrobium biggibum* x *Dendrobium tetragonum*

Later the plant is given a grex name (grex means flock or herd) consisting of the generic name and the grex epithet. All progeny from future matings are known by this name irrespective of which parent was used as the seed parent.

e.g. *Dendrobium* Peewee is a grex name consisting of the generic name (*Dendrobium*) and the grex epithet (Peewee).

Grex epithets are not latinised or underlined/italicised, can be more than one word (a maximum of three) are written in lower case letters with each word beginning with a capital letter and must have been registered with the International Registration Authority for Orchid Hybrids.

In the case of intergeneric hybrids a new name is formed from a combination of the parent generic names:

e.g. *Sophranitis* x *Laelia* or *Laelia* x *Sophranitis* becomes *Sophranlaelia*.

In 1950 it was decided that hybrids involving three or more genera would be given generic names ending in - ara.

e.g. *Potinara* = *Brassavola* x *Cattleya* x *Laelia* x *Sophranitis*

Cultivars

Cultivar is short for cultivated variety. If a person has a superior individual example of a species, natural hybrid or artificial hybrid he may give the plant a cultivar epithet. Cultivar epithets are also given to plants that have been awarded.

e.g. *Dendrobium* Peewee ‘Tropical Star’ is a cultivar name consisting of the generic name (*Dendrobium*), the grex epithet (Peewee) and the cultivar epithet (Tropical Star).

The cultivar epithet is not a varietal epithet (which only can apply to a species) and is not a clonal epithet (there is no such thing).

Cultivar epithets are not latinised nor are they underlined or italicised. They can be

more than one word and are written in lower case letters with each word beginning with a capital letter. The entire epithet is enclosed by single quotation marks. All vegetative propagations (clones) of this plant are entitled to bear the cultivar epithet, however if any of these clones are self pollinated, the resultant progeny are not entitled to bear the same cultivar epithet. An important difference that should be pointed out between varietal epithets and cultivar epithets is that the varietal epithet is given to a race or population of plants that differs in some characteristics from the type species, it can only be applied to a species, never a hybrid. Cultivar epithets are given to an individual plant, species or hybrid, that has been brought into cultivation, from the wild or has arisen in cultivation as a seedling.

Clones or cultivars?

When an orchid is vegetatively propagated, ie divided or mericloned, it is being asexually propagated with the result that all propagules (pieces) are (theoretically) genetically identical. All these propagules, including the original plant, are known as clones. An orchid, be it a seedling or a mature plant, or any other organism, does not become a clone until it has been asexually propagated. People often use the word clone when they mean cultivar.

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