

*Adenochilus gracilis* and  
*Caladenia minor*

—lithography by W.H. Fitch,  
from JD Hooker's *Flora Novae Zelandiae*, 1853.

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# Contents

## Cover

*Adenochilus gracilis* and *Caladenia minor*. Drawing and lithography by WH Fitch, from JD Hooker's *Flora Novae Zelandiae*, 1853.

## Editorials: Ian St George

2. British orchid genera IX: the twayblades. 3. NZ orchids that grow in moss.  
5. Orchids common to Australia and New Zealand. 8. *Thelymitra pulchella* and its relations.  
12. Our yellow *Thelymitras*.

## From the Internet

15. Website for Papua-New Guinea orchids. Royal Botanic Gardens, Kew, and ANOS websites. *Corybas* in China. How to stop your cat eating your orchids. Near Zealand...

## Original papers

16. The New Zealand genera 9: *Gastrodia*. ED Hatch.  
17. Structure and development in the New Zealand terrestrial orchids. ED Hatch.  
19. *Pterostylis alveata* = *P. aff. obtusa* - an update. Gael Donaghy & Graeme Jane.

## The column: Eric Scanlen

22. The *Caladenia minor* imbrogio

## Other islands' orchids

30. Vanuatu

## Notes, news, comments, questions...

31. Ian Rutherford on epiphytes in the Far North. Lucy Moore on *Microtis arenaria*. William Colenso on *Microtis longifolia* and *M. papillosa*. Saprophytes and epi-parasites. *Corybas dienemus*. *Gastrodia* aff. *cunninghamii*? Iwitihi 1999. Margaret Menzies and *Townsonia deflexa*. A yellow *Caladenia*? *Corybas* in two sections. Two forms of *Thelymitra cyanea*.

## Australian notes: David McConachie

34. *Pterostylis* "sub-genera". Salep. *Caleana major*.

## Australasian Native Orchid Society

36. Directory of ANOS groups.

## Close relations: orchids like ours

37. *Corybas mankiensis* from Papua-New Guinea

## Historical reprints

38. Colenso on *Thelymitra fimbriata*. Cheeseman on *Thelymitra pachyphylla*.  
Colenso on *Caladenia variegata*.

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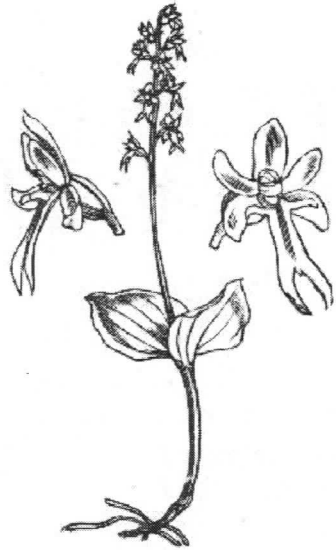
## Editorials

### 1. British orchid genera IX: The twayblades

The twayblades have two leaves, unsurprisingly. Whereas in Britain the term refers to the two species of *Listera*, elsewhere *Liparis* species are also referred to as twayblades. The British *Liparis loeselii* is known on the other hand as the Fen Orchid.

*Listera ovata* is the common twayblade, about as common as *Pterostylis banksii* here. It is widespread and abundant, thriving in many habitats, below ground a matted cluster of long thin rhizomes, its two leaves leathery, flat and borne partway up the stem; the strong 30-60cm hairy stem bears a spike of up to 100 yellow-green flowers April to July. Compared with the shorter flower parts (which form a hood of sorts) the labellum is long, bifid, its 2 lobes rounded. It is pollinated by a range of insects and also multiplies vegetatively.

The lesser Twayblade, *Listera cordata*, is much less common — a rarity in Britain, though more easily found in Europe. "While you are in Wales," David Lang told me, "take the mountain road from Llanbedr up past the lake to Cwm Bychan. Go up the track to the Roman Steps (actually they are medieval steps). Go through the drystone wall where it is broken and start up the steps. At the 32nd step stop and look 7-10 feet to the left on the sheets of sphagnum under the heather." I did just that on 14 June 1986 and found a single plant of the lesser twayblade bearing a single flower. Later in the Swiss Alps I saw much larger plants with spikes of ten or more flowers. The two leaves are 1cm or so long, the plant 10cm tall, the flowers rusty red, the labella bifid to above the midpoint, the lobes pointed. Flowering is May-June, pollination by small flies and wasps, with resort to self-pollination.



*Listera ovata* (above) and *Listera cordata* (below). Artist: W.H. Fitch, in *Illustrations of the British Flora: a series of wood engravings, with dissections, of British Plants*. Drawn by W.H. Fitch and W.G. Smith. 4th edition. London, Reeve & Co, 1897.

## 2. New Zealand orchids that grow in moss

At the Shimanami conference in Japan in May, Irina Tatarenko of the Moscow Pedagogical State University spoke on "Orchids with moss habitats in Russia". She said in Russia terrestrial orchids that thrive in dense moss-cover are called "bryophil." They include *Calypso bulbosa*, *Ephippianthus sachalinensis*, *Goodyera repens*, *Hammarbya paludosa*, *Myrmechis japonica* and *Pogonia japonica*. Bryophil orchids are classified as secondary terrestrial plants. The moss substrate might represent a stage between terrestrial and epiphytic habitats.

Co-evolution of orchids with the ancient moss leads to structural changes in the shoot-root systems. For instance, *Ephippianthus sachalinensis* forms long, short-lived rhizomes without any root: *Listera cordata* and *Pogonia japonica* have straight, short-lived rhizomes and root suckers: and species of *Goodyera* and *Myrmechis* are characterized by creeping rhizomes and evergreen leaves. Such root suckers, creeping rhizomes and absence of roots are not typical characteristics of terrestrial orchids. Furthermore the level of mycorrhizal infection in bryophil orchids is rather lower than in other terrestrial orchids where mycorrhizal fungi are observed not only in the root system but also in the rhizome system.

Some true terrestrial orchids do at times grow in moss habitats, especially those in boggy areas. Thus some species of *Dactylophiza*, *Listera ovata*, *Spiranthes sinensis*, and so on may become secondarily bryophil, to avoid competition with other plants. As a result their structures change slightly; their rhizomes grow straighter; their roots grow longer; and the intensity of mycorrhizal infection decreases.

Bryophil orchids are very sensitive to drainage, grazing and trampling of sub-

strate and they soon disappear if their habitat is disturbed. They maintain their population numbers by intensive vegetative reproduction and rapid seed germination. Nonetheless in many cases populations are not numerous despite enormous satisfactory moss habitats.

The characteristics of bryophil orchids in Russia are therefore (1) moss habitat; (2) creeping rhizomes with no roots; (3) low levels of mycorrhizal infection; (4) sensitivity to habitat damage; (5) vegetative reproduction; (6) scarcity.

Dan Hatch discusses the structure and development of the NZ terrestrial orchids elsewhere in this issue of the *Journal*. New Zealand has three bryophil orchids: *Adenochilus gracilis*, *Townsonia deflexa* and *Corybas cryptanthus*.

I have never seen *Townsonia* growing other than in moss; *Adenochilus* is similarly associated with moss in native bush, though it is certainly found in needle litter under introduced pines; *Corybas cryptanthus* grows under moss or leaf debris in native habitats. *Danhatchia australis* is usually found in deep leaf debris, though has also been reported in dry friable loam. Dan tells me he has never heard of it growing in moss.

*Adenochilus* has a fragile, furry, fleshy, branched, creeping, horizontal rhizome, thickened in places but with no tubers: the stalks of petiolate leaves may arise from cylindrical scale leaves at some distance from the flowering stems. *Townsonia* has small round tubers at the branches of fine, fleshy, creeping rhizomes that run through the moss forest floor; anchoring roots seem to be absent and the stalks of petiolate leaves arise similarly to those of *Adenochilus*.

*Corybas cryptanthus* is an epiparasite with a 1mm diameter, more or less horizontal, rootless, white 10cm rhizome bearing small, pale scale-leaves and small swellings representing tubers; side branches grow out at some of these points, and conical projec-

tions bear 1-4 long hairs. *Danhatchia* is also an epiparasite with a branched network of brittle fleshy rhizomes, 3-5mm diameter, bearing tufts of long, fine, colourless hairs and vestigial scale-leaves, ramifying in the soil to a depth of 20cm; the tips of some of the branches bear flowering stems [1, 2, 3]. (It is worth noting that similar dweller in leaf debris {and often under moss}, *Corybas cheesemani*, has both rhizomes and a tuber - see the photograph accompanying Dan Hatch's paper below).

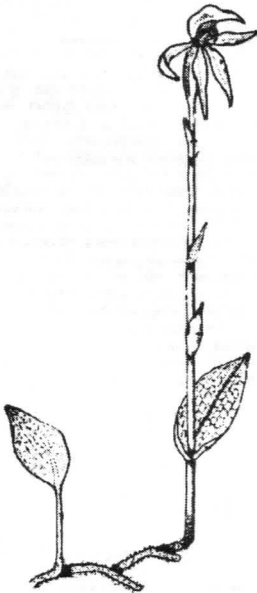
Of these, the fungal associations have been studied only for the two epiparasites. As would be expected of nongreen orchids, Campbell readily found evidence of mycorrhizal infection, though she did not compare

its level with that in other terrestrials [3] [4]. None of the four is common, though *Adenochilus* reasonably so.

NZ thus has bryophil orchids with similarities to those in Russia.

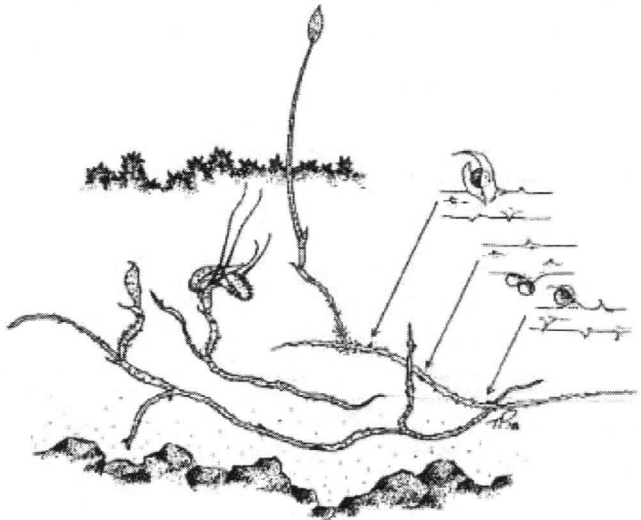
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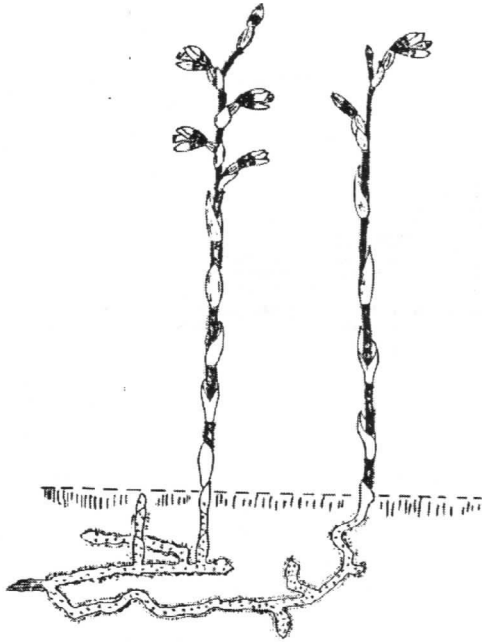
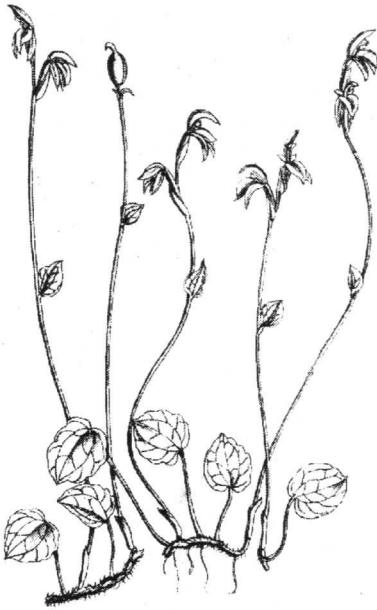
#### *Adenochilus gracilis*.

Drawing by Dorothy Cooper from her "Native orchids of NZ", 1. *The Orchadian* 1978; 6 (1, September): 18-19. (see cover also)



#### *Corybas cryptanthus*.

Drawing by Thom Pendrigh from his "*Corybas cryptanthus* from the Oxford area of North Canterbury". *NZNOG Newsletter* 1988; 28: 7-8.



E.O.H.  
1965

***Townsonia deflexa.***

Lithograph by JN Fitch from a drawing by Matilda Smith. In Cheeseman TF. *Illustrations of the NZ flora 2*. Wellington, Government Printer, 1914. The original unsigned watercolour is in the Auckland Museum collection.

***Danhatchia australis.***

Drawing by ED Hatch from his "Notes on New Zealand Orchids - II". *Trans.Roy.Soc.N.Z.* 1963; Bot 2: 187-8. Campbell noted, "The underground system in flourishing plants is much greater than the drawing by Hatch indicates" [3].

### 3. Orchids common to Australia and New Zealand

The second paper Dan Hatch ever wrote was co-authored by Rev. HMR Rupp, and included a general survey of the orchid genera of both countries, the probable origin of those genera, orchid species common to both countries, possible explanations of the close relation between the two orchid floras, and the description of the new monotypic genus *Aporostylis* [1].

Rupp had written on the subject in 1932, and concluded, "It is conceivable, perhaps, that minute seeds of orchids have been conveyed by wind across the Tasman Sea, and that only those forms which have found

suitable provision for their necessities in the new home have survived." [2]

While NZ remains a botanical outpost of Australia (Brian Molloy's expression), new work into the taxonomy of our orchids, while yet incomplete, has clarified the position on shared species.

Furthermore Peter de Lange and Brian Molloy have introduced the concept of vagrancy [3]; vagrants are taxa that make occasional landfall but never establish here in numbers because of the lack of the appropriate pollinator or the specific mycorrhizal fungus.

Table 1: Hatch &amp; Rupp's list

Valid name	Synonymy	Current status
<i>Caladenia lyallii</i>	<i>Caladenia alpina</i>	Now separated again but NZ may have both
<i>Caleana minor</i>		Still shared: occasional transtasman vagrant
<i>Calochilus robertsonii</i>		Still shared
<i>C. paludosus</i>		Still shared
<i>Chiloglottis formicifera</i>		Extinct in NZ
<i>C. cornuta</i>	<i>Chiloglottis muel-lerii</i>	Still shared but Jones hints there may be several taxa in <i>C. cornuta</i> [4]
<i>Corybas aconitiflorus</i>	<i>Corybas cheesemanii</i>	Now separated again
<i>C. unguiculatus</i>	<i>Corybas matthewsii</i>	Separated again and NZ species called <i>C. carsei</i>
<i>Gastrodia sesamoides</i>		Separated and NZ taxon undescribed.
<i>Microtis unifolia</i>		Still shared
<i>Orthoceras strictum</i>		Separated and NZ species called <i>Orthoceras novae-zeelandiae</i> , but we may have both
<i>Prasophyllum patens</i>		Separated and NZ taxon undescribed
<i>P. rogersii</i>		No longer regarded as shared, though the NZ <i>P. colensoi</i> may contain several taxa
<i>Pterostylis nutans</i>	<i>P. matthewsii</i>	Still shared: occasional transtasman vagrant
<i>P. nana</i>	<i>P. puberula</i>	Separated again: NZ has <i>P. puberula</i>
<i>P. furcata</i>	<i>P. micromega</i>	Separated again: NZ has <i>P. micromega</i>
<i>P. foliata</i>	<i>P. gracilis</i>	Still shared
<i>P. mutica</i>		Separated and NZ species called <i>P. tristis</i>
<i>P. barbata</i>		NZ species recognised as <i>P. tasmanica</i> , which is shared
<i>Spiranthes sinensis</i>	<i>S. australis</i>	NZ taxa may include <i>S. australis</i> , <i>S. novae zelandiae</i>
<i>Thelymitra ixioides</i>		Separated and NZ taxon undescribed
<i>T. longifolia</i>		Not shared
<i>T. aristata</i>		Not shared
<i>T. pauciflora</i>		Still shared, though Jones hints true <i>T. pauciflora</i> may not occur in NZ [4]
<i>T. venosa</i>		NZ species recognised as <i>T. cyanea</i> , which is shared
<i>T. matthewsii</i>	<i>T. d'altonii</i>	Still shared
<i>Townsonia viridis</i>	<i>Acianthus viridis</i> , <i>Townsonia deflexa</i>	Separated and the NZ species called <i>T. deflexa</i> .

Hatch and Rüpp listed 24 species in common, and added another 3 before the paper went to print (Table 1).

Of Hatch & Rüpp's list only eight, *Calochilus paludosus*, *C. robertsonii*, *Pterostylis nutans*, *P. foliata*, *P. tasmanica*, *Thelymitra cyanea*, *T. matthewsii* are still regarded as shared, and possibly some taxa currently included in *Caladenia lyallii*, *Chiloglottis cornuta*, *Microtis unifolia*, *Orthoceras*, *Spiranthes*, *Thelymitra pauciflora* and *Prasophyllum colensoi* will turn out to be common to both countries.

In de Lange and Molloy's list of twelve threatened transtasman vagrants only *Pterostylis nana* and *P. puberula* have since been separated and the rest, *Chiloglottis formicifera* (extinct in NZ), *Pterostylis nutans* (recently rediscovered), *Caleana minor* (critical), *Thelymitra matthewsii* (local), *Calochilus paludosus* (rare), *Chiloglottis valida* (rare), *Pterostylis tasmanica* (rare), *Calochilus herbaceus* (insufficiently known), *Calochilus robertsonii* (local), *Cryptostylis subulata* (local) and *Thelymitra malvina* (local, though Jones omits NZ from its distribution [4]), remain. To this list we should probably add *Microtis arenaria*, *Pterostylis* aff. *obtusa* and *T. media*, all of

which seem to be quite local.

Other species I believe we share include *Caladenia alata*, *Cyrtostylis reniformis*, *Genoplesium nudum*, *G. pumilum*, *M. parviflora* (several taxa may be included) and *T. circumsepta*. *Thelymitra carnea* and *T. pulchella* now seem unlikely: the former may be *T. imberbis* in NZ, and the latter appears now to be a NZ endemic.

Thus perhaps 7 transtasman orchids seem to be well established in New Zealand, a further number currently aggregated with 8 currently recognised species may, if they are separated, turn out to be transtasman taxa, and a further 14 appear to be transtasman vagrants.

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2. Rüpp HMR. Australian and New Zealand orchids. *Victorian Naturalist* 1932; 49: 151-2.
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**Table 2: Orchids shared by New Zealand and Australia**

Established in NZ	Probable aggregates of taxa	Vagrants
<i>Caladenia alata</i>	<i>Caladenia lyallii</i>	<i>Caleana minor</i>
<i>Cyrtostylis reniformis</i>	<i>Chiloglottis cornuta</i>	<i>Calochilus herbaceus</i>
<i>Genoplesium nudum</i>	<i>Microtis parviflora</i>	<i>Calochilus paludosus</i>
<i>Genoplesium pumilum</i>	<i>Microtis unifolia</i>	<i>Calochilus robertsonii</i>
<i>Pterostylis foliata</i>	<i>Orthoceras</i>	<i>Chiloglottis formicifera</i>
<i>Thelymitra circumsepta</i>	<i>Prasophyllum colensoi</i>	<i>Chiloglottis valida</i>
<i>Thelymitra cyanea</i>	<i>Spiranthes</i>	<i>Cryptostylis subulata</i>
	<i>Thelymitra pauciflora</i>	<i>Microtis arenaria</i>
		<i>Pterostylis</i> aff. <i>obtusa</i>
		<i>Pterostylis nutans</i>
		<i>Pterostylis tasmanica</i>
		<i>Thelymitra media</i>
		<i>Thelymitra malvina</i> ?
		<i>Thelymitra matthewsii</i>



## 4. *Thelymitra pulchella* and its relations

There is more than one form of what we know as *Thelymitra pulchella*. David Jones suggested at least three taxa when separating the Tasmanian *T. erosa* [1], and wondered if they had been described as *Thelymitra concinna* Colenso, *T. fimbriata* Colenso, *T. caesia* Petrie or *T. pachyphylla* Cheeseman, all of which Lucy Moore had treated as synonyms of *T. pulchella*.

### The descriptions

In 1853 **Hooker** described *T. pulchella* from plants collected by Colenso from the North Island, by Lyall from Otago and from Moutere hills by Munro [2]. He wrote, "Stem slender, 1 foot high. Leaf very narrow. Flowers glaucous, large, pale purple, very handsome; sepals and petals obovate, acute. Lip broadly obovate, truncate or wedge-shaped. Column shorter than the erect, toothed or fimbriate staminodia. – this is a handsome and very distinct form in the structure and length of the staminodia; I have fifteen very good specimens...." In 1864 he wrote only, "A very handsome species, differing from *T. longifolia* in the usually broader sepals and petals, and the longer, erect, toothed appendages to the column. Flowers  $\frac{3}{4}$ –1 in. diam., fine blue-purple" [3]. Significantly, Hooker did not mention fimbria in that later description.

In 1888 **Colenso** described *T. concinna* from one plant collected by Augustus Hamilton in "open country near the east bank of the River Mohaka, north of Napier". It was an 11cm tall slender plant with a thin leaf and two flowers of 1cm diameter or so. The sepals were brown, the petals blue with a tinge of purple, the column-arms long, curved, erect, with bundles of a few long reddish hairs at the top. Hamilton was unable to find other specimens because

sheep were grazing the area, but he thought it peculiar, and Colenso believed it a "very distinct species" [4]. He had collected the Type for Hooker's *T. pulchella* so he knew the difference.

Two years later **Colenso** described *T. fimbriata* from "Open fern lands, interior; also in similar situations, Fortrose, Invercargill, whence specimen received in a packet: 1888". It was a rather slender plant, 28cm tall, with stem leaves, five flowers of 3cm diameter, violet with darker veins, a broad dorsal sepal and a long narrow labellum. The column-arms extended above the post-anther lobe (which was truncate with short toothed "wings"), and bore spreading, irregular, flat, flexuous fimbria. Colenso distinguished it from *T. pulchella* on the basis of the large, differently coloured flowers with the long narrow labellum and "remarkably fimbriate" column-arms [5]. Again, he knew Hooker's *T. pulchella* and thought this was different.

In 1906 **Cheeseman** described *T. pachyphylla* from plants collected near Westport by Townson and from Kumara (Westland) by Brame. It was a tall (25-40cm) plant with a thick fleshy leaf, grooved and channelled, sometimes 2cm across. 3-6 or more "large and handsome" blue-purple flowers were 2-2.5cm across. The column was short and stout, the post-anther lobe short, broad, indistinctly hoodshaped, truncate at the top with an even or denticulate margin. The column-arms were longer than the post-anther lobe, erect or forward-pointing, flattened, their margins divided into numerous simple or branched fimbria. Cheeseman said its column differed "totally" from that of *T. pulchella*, whose post-anther lobe was shorter than the anther, whose column-arms were barely as long and were irregularly toothed or jagged, "not at all ciliate or fimbriate" [6].

In 1919 **Petrie** described *T. caesia* from plants collected by HB Matthews, flowering

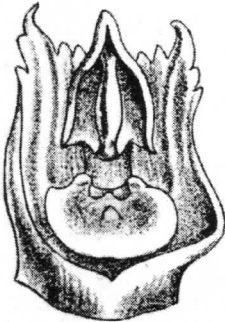
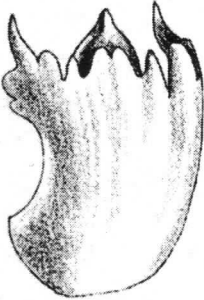
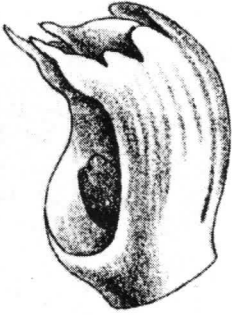


Fig 1: The column of *Thelymitra pulchella*. Lithography by JN Fitch from a drawing by M. Smith, from TF Cheeseman's *Illustrations of the NZ Flora*, 1914.

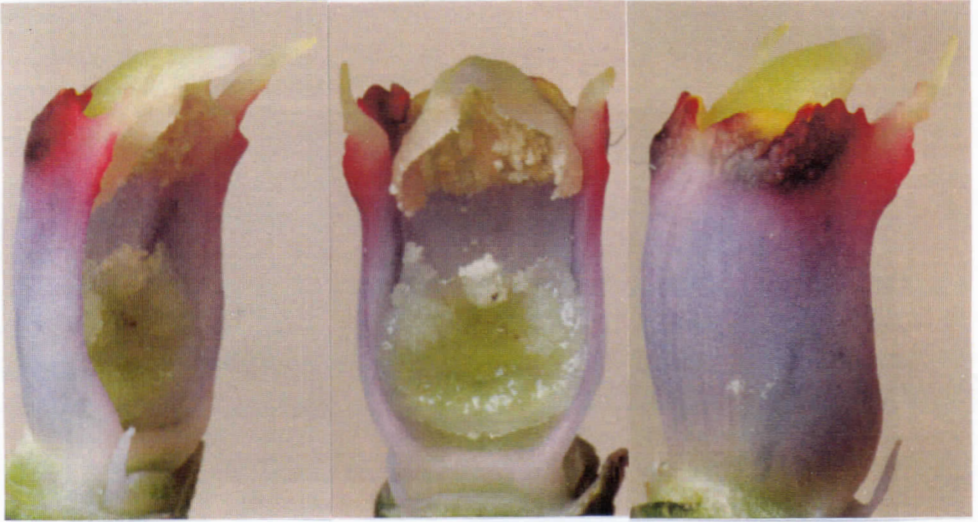
in the "Birkdale-Glenfield Reserve, Waitemata County" in late November and early December. Petrie admitted it was a fairly close ally of *T. pulchella* but made no reference to Colenso's plants. His was a tall (65cm) plant, with fleshy, concave, shiny light-green leaves, about five 2.5cm lavender, but deep blue-streaked, flowers, with a short stout column, the post-anther lobe bifid, its divisions truncately obtuse, thickened and slightly incurved. The short column-arms formed flat plates, fimbriate along their upper margins [9].

### Interpretations

**Cheeseman** was well aware of Colenso's descriptions, but was unable to identify *T. concinna* and *T. fimbriata*. He accepted Petrie's *T. caesia*, which he must have regarded as different from Hooker's *T. pulchella* and his own *T. pachyphylla* [8]. In early reports in the *Transactions* Cheeseman said he collected *T. pulchella* from Titirangi (1871), Lake Rototoi and Wairau Valley in the northern South Island (1881) and Mongonui in the Far North (1889). In 1906 he wrote it was "easily distinguished by ... long erect coarsely jagged (not ciliate) lateral lobes of the column-wing, and a broad and short post-anther lobe which is much lower than the anther"; he now said he had seen no SI specimens [6]. In 1914 he stated he had not seen undoubted specimens from south of the Waikato river, but it was common north of Auckland [7]. In 1925 he suggested Munro's and Lyall's SI specimens (referred to in Hooker's original description of *T. pulchella*), and presumably his own early SI collections were in fact *T. pachyphylla* [8]. His argument went something like, "(i) the column-arms of *T. pulchella* as I now interpret it lack fimbria; therefore (ii) Hooker (who said in 1853 the column-arms might be toothed or fimbriate, but in 1864 only toothed) must have had more than one taxon on the Type sheet; so (iii) there must be another taxon with fimbria; (iv) there is, I've found it, and I call it *T. pachyphylla*; (v) furthermore, I don't recognise Colenso's *T. fimbriata*."

**Hatch** accepted *T. pulchella* (but the column drawings are of *T. circumsepta*), *T. pachyphylla* (but the drawings are *T. hatchii*) and *T. caesia* [10].

**Moore** followed Willis and lumped the lot [11]. She reiterated that Hooker's original description of





**Left page, anticlockwise from top:**

**Fig 2-4:** views of the column of *Thelymitra pulchella* sensu Cheeseman, Kaimaumau: the column midlobe is lower than the anther and the column arms bear no fimbria.

**Fig 5:** pink form of *T. pulchella* sensu Cheeseman. **Fig 6:** white form.

**Fig 7:** The column of *Thelymitra pulchella* sensu Moore from Otago: the truncate midlobe is taller than the anther; the column arms are fimbriate: just ignore the aphides.

**Above, clockwise from top left:**

**Fig 8:** *T. pulchella* sensu Moore from Otago; is this Colenso's *T. fimbriata* or Cheeseman's *T. pachyphylla*? **Fig 9:** ditto from Mt Cargill, Dunedin: note the bifid midlobe.

**Fig 10, 11:** *Thelymitra x dentata*, photographed at the Puffer track, Kaitoke, Rimutakas: note the tiny anther and the absence of pollen grains on the stigma.

*T. pulchella* included fimbriate column-arms. She was aware Cheeseman restricted the name *T. pulchella* to plants lacking fimbria, but she doesn't say she ever actually saw *T. pulchella sensu* Cheeseman. *T. pulchella sensu* Moore, illustrated by Bruce Irwin in *The Oxford book of NZ plants* and in *Flora II*, matches common South Island plants, and has become accepted as the right interpretation of the name. But is it?

### Shall we sum up then?

- *T. pulchella sensu* Cheeseman: both Colenso and Cheeseman were so sure this northern taxon was the true *T. pulchella* Hooker had described, that they separately felt it necessary to describe South Island plants as new. The Smith/Fitch drawing in Cheeseman's *Illustrations* shows toothed nonfimbriate column wings and a post-anther lobe lower than the anther (Fig 1). I have photographed similar plants from the Far North (Figs 2-6). I hope this one will be found on Hooker's Type sheet and affirm Cheeseman and Colenso's opinion that this is the true *T. pulchella*.
- I don't know what Colenso's *T. concinna* is, but *T. hatchii* in the Tararua is the only *Thelymitra* I know with reddish cilia [J59: 28], and it fits the description. It can be "slender". If Colenso did collect *T. hatchii*, *T. concinna* is its proper name.
- Colenso's *T. fimbriata* and Cheeseman's *T. pachyphylla* read as the same to me and the descriptions match *T. pulchella sensu* Moore from Otago and Southland (Figs 7-8 and the one I drew for our *Field guide*), with their squarish, rolled post-anther lobe above the anther and their flat column-arms bearing seaweed-like fimbria. Westland plants photographed by Julie Speer [J68: 25] and those in Ulrich Walthert's native orchid calendar show the same column. It is also the plant drawn by Dorothy Cooper for her *Field guide*. It is the flower labelled "*Thelymitra pulchella sens. strict.* New Zealand, B. Molloy", the last illustration in Jones [1]. Colenso's *T. fimbriata* should have precedence over Cheeseman's *T. pachyphylla* if the two do prove to be the same and if *T. pulchella sensu* Cheeseman proves to be *T. pulchella s.s.*
- Petrie's *T. caesia*? A North Shore plant from Glenfield. The flat fimbriate column-arms suggest *T. pulchella sensu* Moore. Its bifid post-anther lobe may simply show one end of a range of the toothed margin of the rolled edge of the post-anther lobe, such as that of Molloy's illustration of "*T. pulchella s.s.*" in Jones [1], and of flowers from Mt Cargill near Dunedin (Fig 9). We need to examine plants from Glenfield.
- There is a plant in the Rimutakas we call *T. pulchella*; it has a truncate post-anther lobe, and flat column-arms bearing tufts of quite plentiful yellow cilia rather than coarse fimbria (e.g. plate 44 in Johns & Molloy). I suspect it is a variation on *T. pulchella sensu* Moore but it may represent a separate taxon. It is the likely parent of naturally-occurring *T. x dentata* (Figs 10, 11), for this is its Type locality.
- There are likely to be other taxa currently called *T. pulchella* that I don't know about, and one of them may be the true Type: Jones wrote, "An examination of the type specimens of *T. pulchella* shows clearly that this species has striped flowers, a greatly enlarged labellum (similar to that of *T. cyanea* and *T. venosa*) and relatively short (0.5-1mm) column-arms with deeply fringed or lobed margins. This matches a taxon which is common in New Zealand but has not been found in Australia" [1]. I have not seen *T. pulchella* showing that degree of zygomorphism, and indeed the flower labelled "*Thelymitra pulchella sens. strict.* New Zealand, B. Molloy" by Jones lacks such a labellum. (*References p14*).

**Postscript:** Eric Scanlen sent me 15 slides of "*T. pulchella*" from nine sites. The flowers could fit into one of the three taxa:

1. those from Lake Ohia and the Pinnacles track near Thames had neither cilia nor fimbria, had a post-anther lobe shorter than the anther, and appeared to be *T. pulchella sensu Cheeseman* (in the Lake Ohia photograph, although the tepals were striped, the column-arms were blunt, rather like those of *T. carnea*).
2. those from Albany Scenic Reserve, Hewitt Reserve and Te Anau had coarse fimbria and a truncate post-anther lobe taller than the anther; they appeared to be *T. pulchella sensu Moore*;
3. those from the Puffer track in the Rimu-

takas, Massey, Matauri Bay and Ahipara had fine cilia and appeared similar to my specimens of *T. pulchella* "Puffer" (the post-anther lobes were taller than the anther, and varied from truncate to peaked; I could see the back of one and it was nearly as tuberculate as that of *T. nervosa*);

All had columns with yellow/orange/brown tops, flat column-arms and striped perianth segments. The degree of differentiation of the labellum *cf.* the other tepals, the number of tepals striped and the weight of the striping were variable in each taxon.

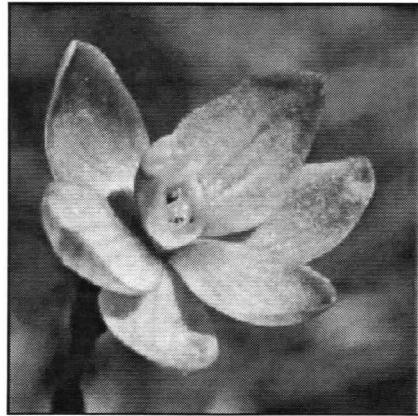
<i>T. pulchella</i>	<i>sensu Cheeseman</i>	<i>sensu Moore</i>	"Puffer"
column-arms	jagged, toothed, bare	coarse fimbria	fine cilia
post-anther lobe	irregular, not rolled, not above anther	truncate, rolled, taller than anther	variable, ?tuberculate, taller than anther
Distribution	Thames, Far North	Whangarei to Southland	North Island

## 5. Our yellow Thelymitras

David Jones did not include New Zealand in the distribution of *T. carnea*, inviting the inference that the NZ plant may be a different species [1].

In 1853 **Hooker** described a yellow Thelymitra which "Colenso, Sinclair etc" had collected in the Bay of Islands. He called it *T. imberbis*, and wrote, "Stems slender, 4 inches to 1 foot high. Leaf narrow linear. Flowers few, small. Bractea broad, acuminate, shorter than ovary. Perianth yellow, ¼ inch long; sepals and petals broad, acute. Column as long as the blunt crenate or fimbriate staminodia" [2].

Robert **Brown** had described the Australian *T. carnea* in 1810, "perianth open, cucullate lateral lobes toothed and bare of hairs, scape 1-2-flowered" [12]. **Hooker** wrote of *T. carnea* in his *Flora Tasmanica*, "A small, slender species, a span to 18 inches high, with the scape strict, or having a strong double flexure, bearing one narrow-linear leaf at the



*Thelymitra carnea* from Kaimaumau, Far North (this one was pink)

base, and two closely appressed bracts. Flowers two to three, flesh- or rose-coloured, small, 1/3 inch across. Segments of perianth acute. Column with a three-lobed apex, the middle lobe truncate or rounded, crenulate, the lateral project-

ing forwards and upwards, rather thick, toothed and warted. Anther short, blunt" [13]. He added in his *Handbook* (1864) "Much better specimens of this... are wanted to establish their distinctness; this is very like the Tasmanian *T. carnea*, but the flowers are said to be yellow" [3].

**Cheeseman** included *T. imberbis* in his 1906 *Manual*, but commented, "...the flowers are said to be yellow, but they are flesh-coloured in all the specimens I have seen. It is probably identical with the Australian *T. carnea*." In the Appendix he wrote, "Mr. R.H. Matthews sends a variety with cream-coloured flowers from Kaitaia" [6]. He included *T. imberbis* in the 1925 second edition of the *Manual*.

In 1946 **Rüpp & Hatch** reduced *T. imberbis* to varietal rank, as *T. carnea* var. *imberbis*. They did so "... with some hesitation. Specimens in Rüpp's herbarium received from H.B. Matthews are more robust than any form of *T. carnea* he has seen, and the column is stouter. But the morphology of the flowers is almost identical, and there does not seem to be any distinction warranting specific separation" [14].

**Moore** [11] followed **Willis** [15] and regarded *T. carnea* and *T. imberbis* as identical, as have the rest of us since. What's it to be then? will *T. imberbis* be reinstated?

#### References for editorials 4 and 5

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- 2 Hooker J.D. *Flora Novae Zelandiae* 1. Reeve, London, 1853.
- 3 Hooker J.D. *Handbook of the New Zealand Flora*. London, 1864.
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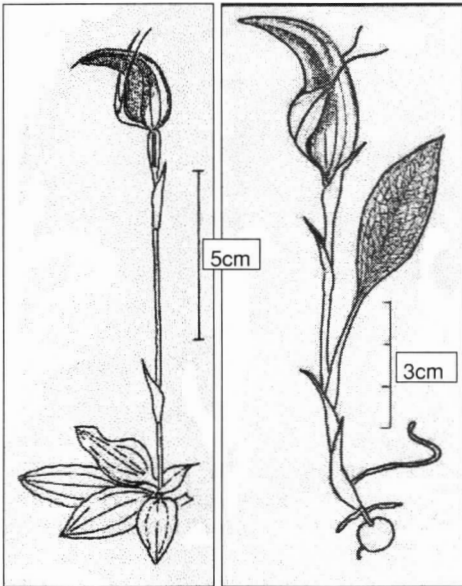
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- 9 Petrie D. Descriptions of New Native Flowering-plants. *Trans.N.Z.I.* 1919; 51: pp106-7.
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- 14 Rupp H.M.R. and Hatch E.D. Relation of the orchid flora of Australia to that of New Zealand.... *Proc.Linn.Soc.N.S.W.* 1946 70: pp53-61.
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Curiously enough, Hooker described another yellow *Thelymitra*. In his *Flora NZ* he identified as *T. pauciflora* a plant collected by Colenso in the North Island; he wrote, "I have four specimens of this pretty little plant, which are all of very slender habit, with narrow ovary, and lanceolate yellow sepals." He described the column-arms as "very long, slender, erect, curving, much longer than the column, feathery at the tip". In the *Handbook* of 1864 he said it was "yellowish" and called it *T. colensoi*, separating it from *T. pauciflora* on the basis of "very narrow sepals and petals, very short column, and very long erect appendages." Hmm. What was this?



## From the internet

<http://www.bandisch.com/PNGorchid/> is an interesting site. Apart from a lot of information on the orchids of Papua New Guinea there are photographs and drawings of many species, including the *Corybas mankiensis* featured in "Close relations" in this issue, as well as two other *Corybas* species, *Cryptostylis arachites*, *Calochilus caeruleus*, and *Pterostylis papuana* and *P. caulescens* (below).



*Pterostylis papuana* (left) and *P. caulescens* (right), from drawings by NHS Howcroft of Papua New Guinea orchids.

The Royal Botanic Gardens, Kew can be reached on <http://www.rbgekew.org.uk/herbarium/orchid/>. The ANOS website, which includes access to NZNOG stuff, is at <http://www.ozemail.com.au/~graemebr/>.

I looked at <http://herbaria.harvard.edu/China/Taxa/vol25-genera.html> and discovered China has three *Corybas*, one *Microtis*, one *Cryptostylis*, three *Gastrodia* and (surprise!) one *Spiranthes*. The website had an email address for questions so I emailed Harvard and asked them about these species but got no reply. I have since heard one of the *Corybas* is *C. taiwanensis*.

Cats eating your orchids? Eric Muehlbauer of Queens in New York wrote, "I have 2 cats among my orchids, and of course they think phrags are grass, not to mention that *Ludisia* is tasty too.... I use a product called Grannick's Bitter Apple, a spray sold in pet stores. It works beautifully, and is completely harmless to pets and plants. I also grow a pot of lemon grass for the cats to chew on as they feel like. The cats chew the leaves, and I cook with the stalks. Any stalk of lemon grass, available in Asian markets or even good supermarkets, will root easily in water and can be potted up."

<http://www.geocities.com/RainForest/Canopy/3934/links.html> provides access to a number of native orchid sites, dealing mainly with North American and European native orchids. For instance, if you click on "Moens Klint" you can read, "My name is Klaus and I live in Denmark...." If you then go to the next window Klaus will tell you, "Moens Klint is a small island in the south east of Denmark. You get there from Zealand crossing a bridge...." Klaus then proceeds to illustrate and discuss the orchids to be found there.





## Original papers

### The New Zealand genera 9: *Gastrodia*

by E.D. Hatch, Laingholm.

***Gastrodia*** R.Br. *Prodr.* 1: p330 (1810).

Name = the pot bellied flower.

**Genotype** – *G. sesamoides* R.Br. *ibid.*

Non-green saprophytes or epi-parasites, with fleshy tuberous rhizomes which usually include several nodes and internodes. Sepals and petals united to form a lobed tube, partly split down one side. Leaves reduced to scale-bracts.

Some 20 species occurring from India and Japan, through Malaysia, Indonesia, New Guinea and Melanesia, to Australia and NZ. NZ would appear to have 4 endemic species; 2 of them undescribed, with long columns and related to the Australian *G. sesamoides* R.Br., and 2 (*cunninghamii* and *minor*) with short columns.

**1: *Gastrodia cunninghamii*** Hook.f. *Flora Novae-zelandiae* 1: p251 (1853)

Named for Richard Cunningham (Allan Cunningham's brother) who visited the Bay of Islands in 1834.

Mature plants are tall and robust with often 40 flowers on the raceme. Flowers ± tuberculate, greyish-green to almost black. The column is very short.

**Nutrition** – Ella Campbell studied this species near Lake Gunn in Fiordland and concluded that there was an epiparasitic association between the orchid and *Nothofagus menziesii* / *fusca*, by way of the fungus *Armillaria mellea*. This cannot however be restrictive, since *G. cunninghamii* occurs in the far north, on Egmont and in Stewart Island where the *Nothofagus* does not grow. cf *Danhatchia* / taraire.

**Distribution** – endemic – North; South;

Stewart and Chatham Is.

**Type locality** – ? (K ?)

**Flowers** – November-February – self pollinated. (The ridges of the back of the column expand like springs and force the pollinia down on to the stigma).

**References**

Campbell E.O. *Trans. Royal. Soc. NZ Bot.* 1 (24): p289 (1962).

Hatch E.D. *Trans. Royal. Soc. NZ* 82: p613 (1954).

**2: *Gastrodia minor*** Petrie *Trans. NZ Inst.* 25: p273 t20 f5-7 (1893).

Name – smaller (than *cunninghamii*).

A very slender, few-flowered plant with narrow brown flowers. The column is short like that of *cunninghamii*.

**Nutrition** – At Lake Manapouri, Ella Campbell found the orchid to be dependent on manuka by way of an unidentified 'basidial fungus, specialised to growth on living manuka roots'.

**Distribution** – endemic – North Island – from the Waitakere Ranges southwards; South Island – Otago, Southland; Stewart Island.

**Type locality** – Dunedin Town Belt – D.Petrie 1892 . (AK 3688 -WELT 19064 – 12.1892).

**Flowers** – November-January – self pollinated (see under *G.cunninghamii*).

**Reference**

Campbell E.O. *Trans.Royal Soc.NZ Bot* 2(6): p73 (1963).

**3: *Gastrodia* aff. *sesamoides*** – First found by Richard Cunningham at Whangaroa in 1834, and tentatively recorded by Allan

Cunningham in the *Precursor* as *Gastrodia sesamoides* R.Br., this plant is now considered to be an undescribed New Zealand endemic.

Plants up to 90cm tall with as many as 20 flowers, varying in colour from white to dark mustard-yellow. The column is almost as long as the labellum.

**Nutrition** – Ella Campbell studied aff *sesamoides* at Silverdale, where it grew with *Acacia melanoxydon*, and determined the fungal partner as *Fomes mastoporus*. The orchid grows with a variety of legumes and pines.

**Distribution** – endemic – North Island – Kaitiaki southwards; South Island ? The southern limit of this species is difficult to ascertain, since it has in the past been confused with *G.* 'long column' (found naturalised in bark mulch in Auckland and Rotorua street plantings\*)

**Flowers** – Oct-Dec; insect pollinated.

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 Cunningham A. *Companion to the Botanical Magazine* 2: p376 n.314 (1837)  
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#### 4: *Gastrodia* 'long-column'

Not unlike *G. cunninghamii* to the casual glance, but has a long column like that of aff. *sesamoides*. There may even be two species included in the tag name.

**Distribution** – recorded from various localities in the North, South and Stewart Islands.

#### References

- Cooper D.A. *NZ Native Orchids* t7 (1981).  
 Moore L.B.& Irwin J.B. *Oxford Book of Plants* p194 f4 (1978)  
 Wilson H. *Field Guide to Stewart Island Plants* #478 (1982).

## Structure and development in the New Zealand terrestrial orchids

by E.D. Hatch, Laingholm (updated 23 June 1999 from Hatch E.D. Auckland Botanical Society *Newsletter* p5 November [1971]; reprinted *Orchadian* September p10 [1972]; and NZNOG *Newsletter* 2: p4 June [1982]).

In New Zealand the terrestrial orchid is a typical monocotyledon. It consists of a creeping, branching rhizome with alternating nodes and internodes. (The nodes are the knobby bits which carry the leaves, while the internodes, as the name implies, are the smooth stretches of stem between the nodes.) Each node bears buds for lead, leaf and branch, and the relative development of these buds depends on their position on the plant. Below the surface leaf-buds form scale-bracts and branches develop freely. Above the surface green leaves are usual and branches less frequent. In those species which lack chlorophyll, the leaves, not be-

ing required for food production, retain their underground scale-bract dimensions. The buds are borne only on the nodes and it follows that any bud-bearing structure must be, or include, a node. The round tuber in *Pterostylis*, *Corybas*, *Acianthus* etc., is therefore an enlarged terminal node, adapted for food storage, dormancy and regrowth, while the so-called 'root' which precedes it is a single elongated internode. Not all these branch internodes bear tubers. Some remain slender, have numerous root-hairs and appear to function only as feeders.

In *Pterostylis* those species which have a bracteate-leaved mature form (I have experi-

mented with *alobula*, *brumalis*, *trullifolia*, and the Australian *coccinea* and *obtusa*), will throw rosettes of juvenile leaves from the nodes of the flower stem in the event of damage to the plant. Usually the lower nodes but sometimes halfway up the stem, and these branch rosettes will in turn produce their own descending, tuber-forming internodes. Working with *P. oliveri* [1], I discovered that if a flower stem comes into contact with the soil it will throw tuber-bearing branches from the nodes (i.e. from the axils of the leaves).

The elongated tuber in *Thelymitra*, *Orthoceras* and *Calochilus*, and in *Spiranthes* also, is an initial node combined with a partly enlarged following internode.

In *Gastrodia* the whole rhizome is enlarged, nodes and internodes together. Scale-bracts and scars of scale-bracts point the position of the nodes.

The function of the tuber is to tide the plant over the dry season and in those species which form several tubers, to provide a means of vegetable increase. In mountain and far-southern species the dormant period is extended to cover the cold season as well. In species which live under relatively damp conditions throughout the year (*Adenochilus*, *Danhatchia*) there is a tendency for the rhizome to be perennial and no tubers are formed. *Corybas cryptanthus* which is normally rhizomatous, will form tubers under adverse conditions, while *Townsonia deflexa* and *Corybas cheesemanii* sport both semi-perennial rhizomes and regularly-formed tubers. Some swamp species are also perennial. *Thelymitra pulchella*, which sometimes grows in water, will often throw a new leaf along the still-green old one, and the same occurs with *Spiranthes*. In *Spiranthes* also, if the plant is too small to flower, it will go on growing and not die back until it has flowered at the end of the second season. Until, that is, it has built up sufficiently large tubers with enough store of food to flower on. *Spiran-*

*thes* can do this because of the swamp environment; 'dry' species are often forced to spend several seasons building up the tubers to flowering size. *Spiranthes* sometimes dies down at the end of the second season without flowering. Bob Bates [2] says '...In the semi-aquatic *Microtis orbicularis* the new tuberoid may begin to sprout before the old plant has died off'.

In species which have different leaf-forms at different stages in their growth, for example the *obtusa* complex in *Pterostylis*, the growth stage depends entirely on the size of the tuber, that is on the amount of nourishment available. In *P. alobula* and *trullifolia* tubers up to 3mm diameter will produce only rosettes, 4-5mm the intermediate flowering form with both types of leaves, while anything above 7mm will produce the mature flowering form with bracteate leaves only. *P. brumalis* has no intermediate stage. The changeover from juvenile to adult is a tuber diameter of 7mm. Similarly in the Australian *P. coccinea* the rubicon is 12mm. Anything below that diameter will produce a rosette, anything above it a flowering plant. The rosette form which the small plants assume, provides a maximum area of green leaf for photosynthesis and results in the rapid formation of flowering-size tubers. This variation in form does not affect species with basal rosettes (*P. nutans*, *curta* etc.) since maximum leaf development is always present. If the mycorrhizome of *P. brumalis* chanced to develop in a congenial spot it will throw some tubers large enough to flower the following season, 2 years from seed to seed. But this is rare – the tubers are normally smaller and develop rosettes. I have done this experimentally and have also grown *Spiranthes* from seed and produced flowering plants in 3 years.

The form the plant takes depends on the development of the leaves and the length of the internodes. Large leaves and short internodes produce conspicuous rosettes like those of *Pterostylis nutans*; large leaves and

long internodes forms like *P. banksii*. Scalebracts and long internodes give plants like *Gastrodia* and *Danhatchia*, while tubular leaves and long internodes give *Genoplesium/Prasophyllum* and *Microtis*. The tall seeding peduncle of *Corybas* and *Chiloglottis* is a single internode. The structure is

simple but the possibilities are endless, and so the orchids have proved.

#### References

1. Hatch E.D. *NZNOG Newsletter* 26: p6 June (1988)
2. Bates R. *Journal of the Adelaide Botanical Garden* 7(1): p48 (1984)



*Corybas cheesemanii*

photograph of two whole plants by Ian St George, Rimutakas 23 June 1999

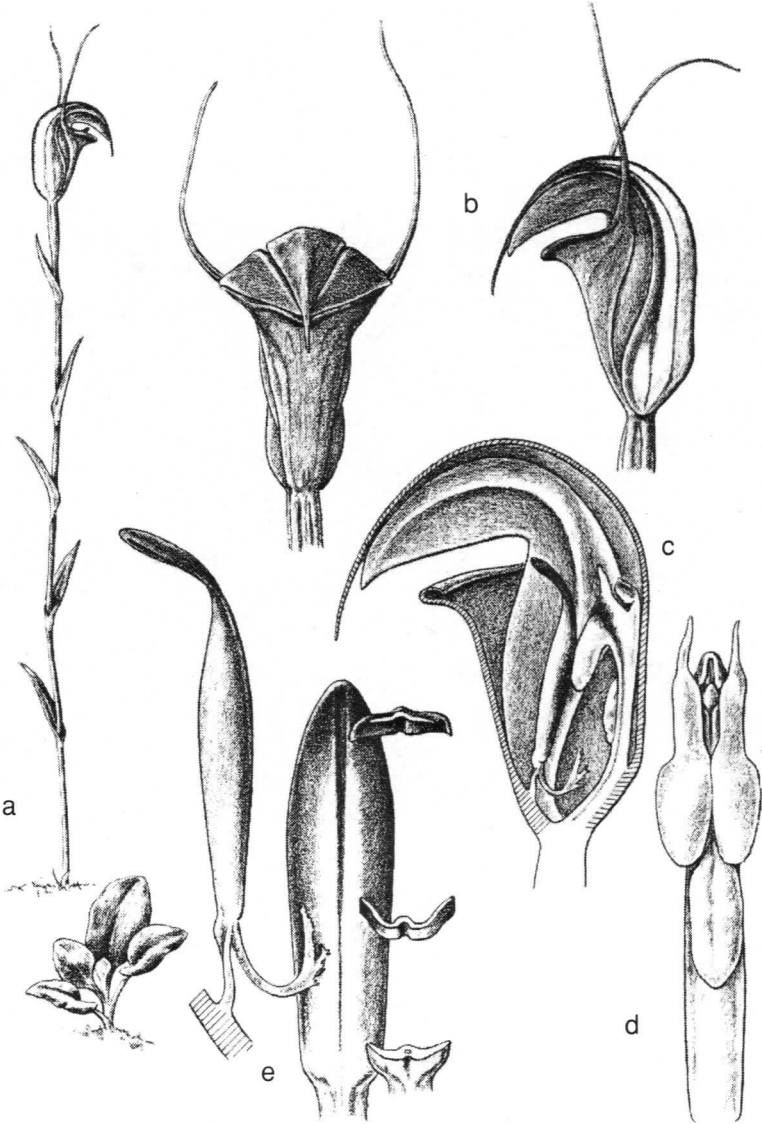
## *Pterostylis alveata* (= *P. aff. obtusa*) – an update

by Gael Donaghy & Graeme Jane, Takaka

Last year in early June Gael stumbled on a strange *Pterostylis* on the Abel Tasman coast: we guessed it belonged to the *P. obtusa* group. During the next 5 months we chanced on plants in a further three quite widely separated localities but we saw only one flower. Of the fifty or so plants we saw, only nine had flowered. The flowering sea-

son was well over by June.

This year we began early, checking for it in mid February. Immediately we found a few fresh flowering buds (all damaged by caterpillars) but no rosettes. A week later, near Tinline, we saw several plants in full flower, apparently initiated after heavy rain three weeks earlier. Flowering lasted about



*Pterostylis alveata*: drawings by Bruce Irwin

- a. Flowering plant life size, with nonflowering rosette.
- b. Flower from front & from side, enlarged.
- c. Flower sectioned longitudinally.
- d. Column from front.
- e. Labellum from side & from front; with sections through labellum.

three weeks. Different groups flowered through March and April (often after rain), with a few groups staggering through to the end of May. Flowers seem to emerge two or three weeks before the rosettes. This year we saw over 300 plants, but no new populations. Flowers are incredibly difficult to spot – only about 30 flowering stems were noted. Among these we saw only 12 flowers at their peak.

Striking features of this *Pterostylis* (seen in the photos and Bruce Irwin's drawings) are

- rosette leaves on sterile plants ovate, ground hugging, especially in open places;
- cauline leaves on flowering plants thick, quite channelled to V-shaped, serrate;
- galea very broad with petals equalling

dorsal sepal in width and length;

- dorsal sepal very short, blunt with a short (1-2 mm) often down-curved point;
- "gape" to the flower very narrow;
- fused part of lateral sepals with a thickened, rolled top edge;
- lip flat and sinus reduced to a notch; and
- column with a prominent red to olive green-coloured band (akin to that in *P. alobula* and *P. trullifolia*).

We took lots of photos and sent a voucher specimen to Brian Molloy so he could sort his way through the *P. obtusa* mess. He decided that it is *P. alveata*. Dan Hatch, in a recent letter to GD, noted as an aside that "it looks rather like the Victorian *P. alveata* Garnet, which I grew here in cultivation for some years."



### The master at work

Bruce Irwin sketching at Te Pahi, Sept 1998; photo by Val Smith.



## The column: Eric Scanlen

### The *Caladenia minor* imbrogio

#### The nitty gritty

1. *Caladenia minor* was described in 1853 as pink with a fringed mid-lobe. The Type sheet(s) included several species but the definitive drawing of *C. minor* s.s. (cover illustration) and Hooker's description, fit only the recently described, greenish cream, *C. chlorostyla*.
2. Colenso's *C. variegata* = *C.* "big pink" found from Iwitahi to the Puffer Track at Kaitoke.
3. H. B. Matthews' *C.* "nitida-rosea", matching Tasmanian *C. fuscata*, was found at Te Paki in 1996.
4. Pink *C. pusilla* with white side-lobes also shows up at Te Paki, the Hunuas and at Huia, is structurally close to the *C. bartlettii* taxon with 2 basal, marginal calli and carmine side-lobes.
5. HBM's *C.* "chloroleuca", a taxon of *C. minor* (alias *C. chlorostyla*) was thriving at Te Paki in 1998.
6. *C. bartlettii* includes two taxa, Dan Hatch's original and possibly a colour form of *C. pusilla*.

Many of the conclusions reached here from texts and photo's, need confirmation from remote Type specimens and live material. Readers' observations and comments are sought.

#### Introduction

The Column has been keeping an eye out for *C. minor* for over 40 years. There were several premature celebrations, the first being in Nov. 1960 when he photographed a drab "creamy" *Caladenia* at Otau Valley in the Hunuas and recorded it as *Caladenia minor*; from Laing and Blackwell's 5th edition! A pink one nearby (*C. pusilla* Fig. 1) got the same name as he joined an elite group, lumping these delightful miniatures

under one convenient label. Names got revised several times as the imbrogio gathered in complexity. But during a whirlwind proof reading of the Editor's new book [1], coinciding with a loan of his *Historical Series* from Bruce Irwin, certain evidence kept figuratively shouting out of the pages that *C. minor* = *C. chlorostyla*. Some surprising corollaries fell out as this imbrogio came apart; read on if you dare.

**1810.** R. Br. or Robert Brown [2], described *C. alata* and *C. carnea* for Australia and Tasmania but not NZ. They are both imbrogio pertinent, especially *C. carnea*. As translated by Dan Hatch, R. Br. wrote, "...Labellar glands in two straight rows, those nearest the column with coloured tips, mid-lobe of the labellum with toothed margins, the disk naked". The disk, or "central portion of the labellum where the lobes meet" [3], had no calli yet there were two straight rows of calli near the column. R. Br. had no calli on the disk of *C. alata* either. He was defining the top of the mid-lobe as the disk wasn't he? and thus started the imbrogio before square one. Australia has two varieties of *C. carnea* which are pink and have toothed margins to their mid-lobes but they are presently under review [4]. NZ's northern pink *Caladenias* do not have toothed margins down the mid-lobe. Scrub *C. carnea* for NZ.

**1853.** Sir Joseph D. Hooker (or Hook. f.) described a pink *C. minor* for NZ only [5]. Fitch's detailed drawing (see cover) was probably made using the best specimen available but bleached from preservation in spirit? The mid-lobe, "subulate, glandular at the margins; disk with 2 series of stipitate glands" [stalked calli], is distinct. From the Hokianga, (D. Hatch, pers. comm.) John

Edgerley had sent Hooker a sheet of several species, mostly *C. alata* R. Br. Lindley's 4 specimens [5] were also accepted by Hooker. (B. Molloy, pers. comm.) In the north, only the recently described *C. chlorostyla* has that labellum. Its flowering period overlaps that of *C. alata* so Edgerley could have included it, plus others, to show the "variability in the species". The labellum has variable red zebra stripes (Fig. 2) but with its standard greenish white tepals, it is stretching things to call it "pink". Quite probably, Edgerley observed that they were usually pink, meaning his lumped complex of the fringed *C. minor* (m), *atradenia* (at), the deep carmine *bartlettii* (b2), pink *fuscata* (f), *pusilla* (p) plus pink & white *C. alata* (a). Later reports from the south of fringed *C. nothofageti* (n), deep carmine *bartlettii* (b0), plus pink aff. *carnea* (ac) and *variegata* (v) would add to the (m) complex. **N.B. these abbreviations are used extensively below.** The choice of Type specimen for (m), would surely be from Fitch's drawing. Hence what we know as

*C. chlorostyla* = *C. minor* — unless this logic is flawed — what alternative is there? Sir Joseph should have recognised (a) R. Br. The imbroglia was at stage 2.

**1864.** Sir Joseph said (m) was abundant in the Northern Island [5]. No one species is abundant anywhere but taken together, they would be, even now. He did not include *C. carnea* in NZ's flora.

**1885.** William Colenso, under *Caladenia variegata* (v) at Norsewood [7], agreed with Sir Joseph that (m) was common in the north thus confirming that northern *Caladenia* were being lumped as (m). Colenso makes no mention of *C. carnea* in NZ either. Part of

his description of (v) caught the Column's eye. "... two longitudinal rows of bright yellow stipitate glands ... **with smaller glands scattered on each side**". The Column's 3-D close-ups (Fig. 3) feature these scattered calli in *C. "big pink"* — (ac) to some — common at Iwitahi and the Puffer Track, Kaitoke [J66:24]. Other features also fitted the Bill. *Caladenia variegata* (v) = *C. "big pink"*.

**1906.** T.F. Cheeseman [8] accepted Hooker's pink (m), including "... middle lobe ... margins fringed with linear calli;" In a footnote, he separated from the complex, var. *exigua* (now (a) [J65:16]) forgetting that R. Br. had already described it for Australia. See how an imbroglia develops?

**1863 to 1926** in the *Transactions* [9] no less than 14 learned souls report (m) NZ wide but no other *Caladenia* (except *C. lyallii* and *C. bifolia*, now *Aporostylis bifolia*). The 14 reported from: Otago (J. Buchanan) through Nelson (T. Kirk) to Mangonui (H.

Carse). That is, when any of them reported any of those detailed above, they must have lumped them under (m). Notably none of the 14 reported *C. carnea*. H. Carse did mention that H.B. Matthews had "... dropped on a *Caladenia* with greenish yellow flowers." HBM had described [10] without publishing, *C. "chloroleuca"*, a taxon of (m) (alias *C. chlorostyla*) with "lateral lobes and column wings lined purple-pink", from Kaitaia. On the first draft (where he named it *C. "viridis"*) he inscribed, "H. B.

Matthews, H. Carse". Bruce Irwin and the Column saw a colony (Fig. 4) in the Shensstone Block, Te Pahi, Oct. 1998. Bruce fretted at the delay whilst the Column hastily captured an "ordinary" *C.*

**KEY**

- a = *C. alata*, pink & white
- ac = *C. aff. carnea*, pink
- at = *C. atradenia*
- b0 = *C. bartlettii*, deep carmine without basal calli
- b2 = *C. bartlettii*, deep carmine with 2 basal calli
- f = *C. fuscata*, pink
- m = *C. minor*, fringed
- n = *C. nothofageti*, white
- p = *C. pusilla*, pink
- v = *variegata*, pink



*chlorostyla*! The usual zebra stripes to the inner side-lobes and column are replaced by an almost uninterrupted maroon. The unusual grey-white hairs on the stem show and twin flowers were the norm.

**1945+**. Dan Hatch [11] debated with the Rev. H.M.R. (Monty) Rupp, but compromised on *C. carnea* var. *minor* for **(m)** from typical specimens on the Parau Track near his home. They are **(m)** (alias *C. chlorostyla*) going by his photo's (**Fig. 5**). He split two from the complex, *C. carnea* var. *bartlettii*, now **(b0)**, and, just as a colour form, the present **(at)** (**Fig. 6**). So with **(a)** and **(v)** already out, that leaves, **(f)**, **(p)**, **(n)** and **(ac)** still in the **(m)** complex. Dan followed precedent and Rupp, favouring varieties and forms to let the name give a clue to the orchid's family tree. The now *Caladenia atradenia* D.L. Jones, Molloy & M.A. Clements came out according to Dan, logic and the rules, as *Caladenia carnea* R. Br. var. *minor* (Hook. f.) Hatch forma *calliniger* Matth. ex Hatch. Matthews' "Caladenia calliniger Matth." was more concise but he failed to publish. The name's outlandish size made a mockery of the hallowed botanical convention of using part of a plant's classification as its name. Rupp's lumping brought the misnomer *C. carnea* into the NZ scene and upset the apple cart for the next 52 years. Dan used Fitch's celebrated drawing, to illustrate that distinctive labellum but he now added white to Hooker's pink, for **(m)**.

**1970**. Lucy Moore [12] lumped four of the **(m)** complex into *Caladenia carnea* thus helping Rupp to worsen the imbroglgio. Hooker's pink now widened from white to red. Lucy keyed out the four "infra-specific taxa" in an extensive foot-note. It included Dan's var. *minor* forma *calliniger*, now **(at)**, var. *exigua*, (had been **(a)** since 1810), var. *bartlettii*, now **(b0)** and Dan's var. *minor*, clearly **(m)**, having "Mid-lobe ... with marginal calli almost to its tip." and

"Labellar calli yellow, in two distinct rows, absent from surface of mid-lobe; labellum-tip pale."

**1983**. Dr Brian Molloy [13] ousted *C. carnea* from NZ at long last but replaced it, following Don Blaxell [14] with *C. catenata* (Smith) Druce (= *C. alba* R. Br.). Don had read Dr Winifred Curtis' book [15] and also involved Bentham and Hallé. The polite professional etiquette of following precedent had only compounded the imbroglgio. Both *C. catenata* and *C. carnea*, although obviously related, were only misnomers in NZ for the remnants of the **(m)** complex. Winifred, Don and Brian had most students of NZ orchids side-tracked for two years; longer for many. In [4] and [16] *C. catenata* is white or faintest pink, save for its maroon inner column, fringed and gold tipped mid-lobe. Brian's doubts about the *C. catenata* misnomer, show in his [13] plate 11 with an excellent shot of **(m)** (alias *C. chlorostyla*), plate 12 with **(n)** and plate 13 with a southern **(ac?)**. In the tradition of lumping, all were labelled *C. catenata* yet they were all different. But Brian was still working on it.

**1985**. Mark Clements [6] reported that *C. minor* "figured by Hooker, do not represent typical *C. carnea* R. Br." Caught up in the Rupp, Hatch, Moore precedent, Mark scotched the *catenata* connection but reinstated *C. carnea* var. *minor*. Mark had whittled down the imbroglgio but he had lots more to do.

**1988**. David Jones' epic work [3] gives only the briefest mention of pink *C. carnea* var. *minor* or **(m)**, for NZ and Australia, with no illustration, possibly in deference to his colleague, Mark Clements. David attributed **(a)** to NZ as well as Australia thereby tacitly extinguishing its *exigua* and *catenata* connections. Still unnoticed in NZ's **(m)** complex were the pink **(f)**, **(p)**, **(b2)**, **(ac)**, (the last a complex itself) & the fringed non-pink **(n)**. David too would have more to say later.

**1988.** Doug McCrae [17] put the tag *C.* “green column” on (**m**) at Te Paki in the far north. He also referred to a pink “*C. minor*” there, probably some of the (**f/p/b2**) complex which the Column and successive NOG field parties have often found — never with fringed mid-lobes. It seems Doug had switched species and started the era where orchidologists prodded the botanists to “properly” describe this “new” species. *C.* “green column” (alias *C. chlorostyla*) was undoubtedly (**m**) all the time. That fringed mid-lobe with no calli on top is unique in the north. Note that it is quite variable in itself. Some have red stems and buds, some have hooked marginal calli and the colour and degree of striping vary inside the side-lobes and column. It would make a sizeable study on its own.

**1989.** Ian St George [18] after consultation with Brian and Doug, updated the Flora [12] and referred readers to Brian’s [13] plate 13 (**ac?**) as “*C. minor*” and we see for the first time, the triangular, entire, yellow mid-lobe which the NZ Native Orchid Group have been attaching to “*C. minor*” for the last 10 years: but why? Who misread Lucy Moore’s key, underlined above?

**1989.** Mark Clements [19] must have come across other imbroglios too because, in a mammoth project, he revised all orchid species from Australian and “the external territories” (including NZ? — cheek!) by systematically seeking out extant Type specimens, original descriptions and illustrations and **ignoring all other comments**. His aims were admirable, (to avoid the inevitable errors from successive lumpers and splitters?) but he lumped 5 species into (**m**) including 3 of Lucy’s [12] plus the 2 Matthews/Rogers *Petalochilus* species. Perhaps these were on Ederley’s Type sheet? Mark thus reinstated (**m**), as an expanded complex, to NZ but confused *C. iridescens* (4 rows of calli) with (**at**) (2 rows of calli) yet to be renamed for the 6th time! Remarkable, for

NZ’s least variable, most easily distinguished *Caladenia*. One of Mark’s 5 infraspecific (**m**) taxa was *C. carnea* var. *pygmaea* Rupp [11] (now (**p**), *C. pusilla*) but no NZ specimen is detailed. Mark still hadn’t finished.

**1993.** Ian [20] grieved in the editorial, about “The *Caladenia carnea/catenata* complex”. He wrote in part, “I sent 7 slides of representatives of the complex to our three leading native orchidologists. They were unanimous on *none* and two agreed on only one.” Ian sent 26 of his *Caladenia* transparencies to the Column on 22 May ’99 and no wonder there was confusion! Seven of them matched no described species clearly. All 7 were Mainland and Wellington taxa. Unfair!! All the recognised species had been described from north of Wellington, hadn’t they? From Shag Point Dunedin, Ian has three shots of a (**ac**) taxon, with a very wavy-edged mid-lobe **Fig. 7**. It could be Hooker’s original, pink *C. minor*, had it grown in the north. It has an all-green column-back and pink tepals like (**v**) but no visible scattered calli. There is a twin flowered (**m**) (alias *C. chlorostyla*) from Manapouri without a fringe to the mid-lobe. There is more work to be done with these southern pinks.

**1993-4.** Noeleen Clements and Val Hollard [21] had *C.* “green column” or (**m**) as *C. carnea*, now (**p?**), Ian’s “*C. minor*” from Brian’s plate 13 [13] and a *C. catenata* (**f/ac?**). Their last 3 names are just synonyms for the same complex. Noeleen knew her orchids but she had followed the pundits into near peak imbroglgio. Confused? So was the Column. Their “*C. minor*” is one of the (**ac**) complex which is presently a catch-all for any pink *Caladenia* that doesn’t exactly fit a named species. The Column used this Guide as his *Caladenia* text for several years, but looking at it now, he had to take an hour off to regroup his mangled criteria.

**1995.** Gary Backhouse and Jeffrey Jeanes [4] diplomatically included (**m**) in (**p**), (Mark had included (**p**) in (**m**)!) and thus increased the imbroglia if only a little. The mid-lobe margin of (**p**) is only crenulate. With its white side-lobes and few basal, marginal calli, (**p**) fits pics the Column has filed (**Fig. 1**) from the Hunuas to Te Paki since 1960. They were filed at different times as *minor*, *carnea* var. *bartlettii*, *catenata*, *carnea* and *bartlettii*. Now, sixth time lucky, they are *C. pusilla*!

**1996.** *The Field Guide* [22] dropped *C. catenata* (hurrah!) but continued the fable of “*C. minor*” with an entire mid-lobe. But it included a separate (**ac**), being (**v**) plus other taxa, along with *C.* “green column” (**m**) and “white form”, now recognised as (**n**). *C. carnea*, here (**b2**) **Fig. 8**, also featured — with 2 basal marginal calli but using Dan’s “dark glazed mauve” which was for his *C. carnea* var. *bartlettii* (**b0**) with no marginal calli. The reader can be excused for thinking confusion was worsening but the Field Guide actually represented a *Caladenia* advance.

**1996.** Tony Bishop [16] depicted the two *C. carnea* varieties mentioned earlier, pink and with toothed mid-lobes, for NSW and Victoria. Neither of them have been seen in NZ have they? His pics and descriptions of (**p**) and (**f**) show their close relationship with *C. carnea* var. *carnea*. *C. minor* is conspicuous by its absence in this book. An astute operator, Tony.

**1997.** David Jones, Dr Brian Molloy and Dr Mark Clements [23] brought some order out of imbroglia and described four of those remaining in the (**m**) complex, (**at**) **Fig. 6**, (**n**) [J66:25], (**b0/b2**), and *C. chlorostyla*. Brian is not convinced but the last is surely (**m**). Nothing else in the north has Fitch’s and Hooker’s mid-lobe “glandular at the margins”, bare on top. N.B. (**at**) **Fig. 6**, has

the fringe on the mid-lobe but also has prominent calli on top so does not qualify. *C. bartlettii* includes Dan’s description [11] (**b0**), (no marginal calli) and Bruce’s drawing [22] (**b2**) with the 2 marginal calli at the base of the mid-lobe, the latter making it difficult to separate structurally from *C. pusilla* (**p**). The Column has yet to find a “dark glazed mauve” [11] *Caladenia* with no marginal calli, to match Dan’s description. A field trip to the Wade River, Silverdale is a must this October. The (**m**) complex had by now spawned five offsprings (**v**, **a**, **b0**, **at**, and **n**). (**b2**) may yet be a colour form of (**p**).

**1998.** Mark Clements [24] illustrated *C. fuscata* (**f**) for Tasmania; it lacks the Victorian “forward pointing triangular extensions on front edges” of the side-lobes [4]. Its 3 or 4 basal marginal calli now make it a close fit for an October taxon at Te Paki (**Fig. 9**) and agrees well with Tony’s [16]. Checking through H.B. Matthews unpublished descriptions [10] his “*Caladenia nitida-rosea*” = *C. fuscata* = **Fig. 9**.

**1999.** Our NZNOG Convener and Editor, Ian St George, has produced a much sought new work on NZ orchids [1] with colour photo’s. His second draft sparked the investigation you see before you but alas, too late. So three old faithful misnomers will be found including “*C. minor*” (one of the (**ac**) complex?), “*C. chlorostyla*” (**m**) and “*C. aff. carnea*” or (**v**) with a photo’ of “*C.* ‘big pink’” by the Column who thus rejoined an elite group and contributed to the imbroglia, albeit with “minor” misgivings. Ian’s *C. bartlettii* (Column’s shot, from Te Paki) could be called (**b1**). It has 1 hooked marginal callus. (**f**) and (**p**) will be missing. The Column hopes that this study will lessen the *Caladenia minor* imbroglia and perhaps give Caladeniologists something to get their teeth into.



Fig.1 ↑  
Fig.2 →



Fig.3 →  
← Fig.4



The *Caladenia minor imbroglio* — Turn to page 29 to read the captions for the figures.



Fig.5 is bottom left.  
Clockwise from Fig.5 are Figs 6, 7, 8, 9.

## Captions for the figures

### Page 27

#### (clockwise from top left)

**Fig.1:** *Caladenia pusilla*, Hunua Ranges, Oct. 1960.

**Fig.2:** *Caladenia minor*, red-stemmed form, Albany Scenic Reserve Nov. 1993.

**Fig.3:** *Caladenia variegata*, Puffer track, Rimutakas, Dec. 1997: unusual form with two double rows of calli.

**Fig.4:** *Caladenia minor* = HB Matthews' "C. chloroleuca"; note fertile bract in lieu of third flower.

### Page 28

#### (clockwise from bottom left)

**Fig.5:** *Caladenia minor* by Dan Hatch; red-stemmed form from Parau track, Waitakeres.

**Fig.6:** *Caladenia atradenia*, toothed margin and top of midlobe.

**Fig.7:** *Caladenia* aff. *carnea*, Shag Point, Dunedin, by Ian St George; note wavy edged midlobe and typical bright green column of SI specimens.

**Fig.8:** *Caladenia bartlettii* (b2) or *C. pusilla*? Note 2 basal calli but structure similar to Fig. 1.

**Fig.9:** *Caladenia fuscata* from Te Paki; note four marginal calli at base of midlobe.

### Acknowledgements

Ian's *Historical Series* with Dan Hatch's Latin translations, bring together all the significant early texts on NZ orchids and open a door (or Pandora's box?) to anyone wanting the dinkum oil. These plus the NZNOG *Newsletters/Journals*, the texts below and the benefit of hindsight, have made this study possible. The Column is grateful for comments from Dan Hatch, Val Hollard, Bruce Irwin, David Jones, Brian Molloy and Ian St George.

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## Other islands' orchids: Vanuatu

— extracts from B. Lewis & P. Cribb. *Orchids of Vanuatu*. RBG, Kew, 1989.

The Orchidaceae form the major component of the epiphytic flora of Vanuatu....

Approximately two-thirds (62%) of the species are epiphytic with a third (38%) terrestrial, four of these being saprophytic....

Situated almost in the centre of Melanesia, the islands of Vanuatu have significant proportions of their orchid flora in common with Australia (14%) and New Caledonia (41%) in the southwest, New Guinea (42%), Bougainville and the Solomon Islands (62%), and the Malay archipelago (24%) in the northwest, and other eastern Pacific islands (53%). The flora of this island group thus exhibits a much greater intermingling of Palaeo-Oriental, Australian and Pacific elements than that of the Solomon Islands.

The proximity of New Caledonia with its strange flora has had a marked effect on the flora of the southern islands of Vanuatu. For example, *Megastylis gigas* and *Dipodium punctatum* var. *squamatum* are endemic to New Caledonia and the southern islands of Vanuatu.

In this account 158 species of orchid have been recorded in 69 genera. This is probably an underestimate and the number is likely to increase as the islands become better known.

The figures (for each island) almost certainly reflect the amount of collecting done on each island as much as the species diversity of the islands, for there are few collections of orchids from the islands in the north-east and it would pay future expeditions to concentrate on this area. There are many rich areas of forest on north-west Espiritu Santo which have yet to be fully explored.

It is thought that orchids have reached the Pacific Islands by long distance wind dis-

persal of their seeds. Cool temperatures, such as would be experienced if the seed were lifted by wind to high altitude, is known to prolong the viability of seed in the laboratory, and the light seeds of orchids are adapted for long-distance wind-dispersal. The appearance of orchid species amongst the first colonisers of Krakatau is well documented. The predominant winds in the region, the south-east Trades, blow from south-east to north-west and are quite sufficient to take Asiatic orchids to the Pacific Islands, for example *Bulbophyllum longiflorum*, *Spiranthes sinensis*, *Liparis condylobulbon* and *Epipogium roseum* are distributed from Africa to the Pacific Islands. The possibility of an orchid seed germinating and establishing itself is also dependent upon the presence of a suitable symbiotic fungal partner and we suggest that this requirement is probably the major limiting factor for orchids in the Pacific. The colonization of an island by an orchid species is thus a haphazard affair.

A further problem faces a colonizing orchid and this is the need for a pollinating agent. Some of the most widespread species have overcome this by being self-pollinating, for example, *Spiranthes sinensis*, *Liparis condylobulbon* and *Calanthe triplicata*. Most orchids are capable of vegetative reproduction and will survive long periods without sexual reproduction.

*NZ shares six genera (Bulbophyllum, Corybas, Cryptostylis, Earina [?], Microtis and Spiranthes) but only three species (Microtis aff. parviflora, M. unifolia and Spiranthes sinensis) with Vanuatu. Gastrodia cunninghamii, misidentified on Vanuatu in the past, is a NZ endemic — Ed.*



## Notes, news, comments, questions

Ian Rutherford wrote, "Large mats of *Bulbophyllum pygmaeum* were observed on trees overlooking the banks of the river at Waitotemarama Gorge in the Hokianga. Unfortunately I did not see any in flower but the plants were quite larger than I had seen before. The leaf was 15mm x 4.5mm average, and the leaf bract 3mm high: some leaves were longer than this. The mat I observed at Hohi on the East coast averaged only about 8mm long. This was the first time I had seen *Bulbophyllum* growing on kauri, though I have seen *Winika* growing on kauri on the Waitotemarama track.

"On 13 March I went on a Forest & Bird trip to Pipiwai Road, Kaikohe to view an old volcano crater, and stumbled across some nice windfalls, mainly of *Winika* and *Earina*, but we were all delighted to find a lot of *Bulbophyllum tuberculatum*. The leaves were 4.5mm wide and 20-25mm long, all of them twisted at the middle. I have found *B. tuberculatum* at Kaingaroa, Far North, but only smaller, and with a straight leaf.

"In my own orchid collection I now have *Earina valida* from the Islands (ref: J50). This is quite different from the NZ earinas in many respects, and has a lovely white flower. The plant looks much like a cymbidium in that it is bulbous, has a leaf much like a cymbidium as well as the die-back point on the leaf."

Allan Ducker found *Microtis arenaria* [Lindl. *Gen. Sp. orchid.* Pl.306 (1840)] at Motutangi in 1996 [J58:16-18]. I did not notice then that Lucy Moore had collected it 32 years earlier, and mentioned it in *Flora II* [p154]. She wrote (under *M. unifolia*): "In shape and ornamentation the labellum shows considerable variation. Two plants from Orewa Hill (CHR 141203, 23/10/64,

*LB Moore*) stand rather apart in having the tip definitely bilobed with a minute recurved mucro on the under side of the sinus. These features fit descriptions of *M. biloba* WH Nicholls in *Vict. Nat., Melb.* 66, 1949, 94, 93 fig J-L, which Willis (*Handbk Pl. Vict.* 1962, 364) records as known in Victoria only by the type and one other collection, apparently also in N.S.W. Other characters are the narrowly acuminate tip of the dorsal sepal, poorly developed basal calli of the labellum, and wide horizontally extended column wings. Collections at WELT from Whangarei, Chelsea and Mt Eden contain plants with rather similar fls but these have not been examined critically." *It would be interesting to see what Microtis are growing on Orewa Hill nowadays — Ed.*

While we are on the subject of all the taxa that have been lumped into *Microtis unifolia*, it is worth recalling that Forster's scant original description (1776) was written about a plant flowering on Long Island in Queen Charlotte Sound on 13 September during the visit of the *Resolution*. Old names currently regarded as synonyms are available should the different forms being discerned now match their Type specimens. These are Swartz's *Epipactis porrifolia* (1800), Hooker's *M. banksii* (1835), but especially Colenso's *M. longifolia* (1885) and *M. papillosa* (1886). *M. longifolia* was flowering in February and March near Norsewood in 1883-4, a tall stout plant with stemmed, well-separated flowers with bifid-tipped labella. *M. papillosa* flowered in October 1884 at Kaipara Heads; its labellum had 4 calli. It would be interesting to see *Microtis* from Norsewood and Kaipara Heads at those times this year, and most interesting to see a *Microtis* from Long Island gathered this September.



Uncertain as to the difference between a saprophyte and an epiparasite, I asked the oracle, Dan Hatch, who replied, "A **saprophyte** is a plant, not necessarily an orchid, which encourages a fungus to invade its tissue, then seals it off and ingests it. The fungus meanwhile lives indiscriminately on decaying matter in the substrate. *Corybas cryotanthus* is a good example. An **epiparasite** is a plant living as above on a fungus, which in turn is parasitic on (= epi-) the rootlets of a tree or other species. For example the orchid *Danhatchia*, the fungus *Lycoperdon perlatum* and the tree taraire, nikau, etc."

Mark Fountain of the Royal Tasmanian Botanical Gardens replied to my request for information about *Corybas dienemus* (Tasmania has responsibility for Macquarie Island), "Botanists who have seen it in the field describe it as very ephemeral (I assume they mean by this more so than the average orchid), disappearing from known sites for several years only to re-appear nearby. I think there are potential pollinators on the island in the form of gnats associated with the breakdown of the seaweed *Durvillea antarctica*. The *C. dienemus* we saw had their flowers buried deep in the moss which might point to a different pollinator. Apart from the taxonomy I don't know of any research into this orchid."

Browsing the other day I found several old slides of a pale green, sparse-flowered, **short-columned** *Gastrodia* (pictured at right) which I photographed at Paradise at the head of Lake Wakatipu in 1982. I saw similar plants several times around Queenstown, always in the gloom under beech, and took them to be wan specimens of *G. cunninghamii*. But in these days of splitting, is it Colenso's *G. leucopetala*? those dorsal sepals look uncommonly long. Have others seen this? ▶▶



## IWITAHI NATIVE ORCHID WEEKEND 1999 10-12 DECEMBER

**PUT IT IN YOUR DIARY NOW!**

Information from Trevor Nicholls: 33 Hinekura Ave, Taupo 2730, New Zealand;  
phone: 64-7-378 4813 fax: 64-7-378 3222 email: nicholls@reap.org.nz

**A yellow Caladenia?** Writing on past reports of yellow *Thelymitra* (p15), I remembered that Karlie Birchall had written (16 November 1992, J45:13), "Have just come home from a lovely weekend down the East Coast and have another 'find' to add to the list for the Haparapara River area, Omaio Bay—namely *Caladenia catenata*—the yellow version. In all I counted sixty-four plants and seedlings growing on the verge of an old horse track in ti-tree litter and moss in a very dry site. Couldn't believe my eyes—they are so tiny. I must have walked past them a dozen times and not seen the plants...."

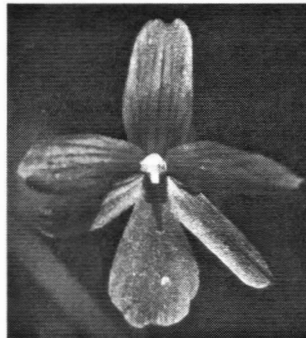
**Corybas was divided** into two sections by van Royen in 1983 [1]. *Corybas* with two spurs at the base of the labellum remained *Corybas* in his classification, and those where the spurs are replaced by open auricles or slits became *Steleocorys*. (Section *Corybas* was in turn subdivided into *Corybas* and *Gastrosiphon* by Dransfield *et al* [2]). *C. cheesemanii* and a number of the Australian "helmet orchids" belong to *Corybas*; the rest of ours are in *Steleocorys*. All those west of Wallace's Line are *Corybas*, and interestingly



Margaret Menzies photographing *Townsonia deflexa*, Ruapehu, December 1998

the Chinese *C. taiwanensis*, and *C. himalaicus* from northern India and Mianma (among others) have blind spurs as well as long tepals. (Wallace's Line runs north from the Indian Ocean up between Bali and Lombok, to the right of Borneo, turns a little right and runs below Mindanao to the Phillipine Sea).

**References:** 1. van Royen P. The genus *Corybas* [Orchidaceae] in its eastern areas. *Phanerogamarum Monographiae* Tomus XVI. J.Cramer, Vaduz. 1983. 2. Dransfield J. *et al.* *Corybas* west of Wallace's Line. *Kew Bulletin* 41 (3). 1986.



*Thelymitra cyanea* — zygomorphic, yes, but dimorphic too? The one at left is a solitary plant, its tepals narrow-oblong, labellum clubshaped, unstriped; that at right forms clumps, has oval tepals (all of them striped) and a pointed labellum.



## Australian notes: David McConachie

**I**n the April issue of the *NOSSA Journal* there was a small article by Bob Bates entitled *Pterostylis* “sub-genera”.

“For the last few years we have been hearing more and more frequently about the genus *Pterostylis* (greenhoods) being divided into several genera (or sub-genera) with only the single flowered greenhoods with a basal rosette and long roots with droppers being true *Pterostylis*. For twenty years I have been in favour of some recognition of the various discrete sections.

“This is particularly true of the species with multiple flowers. How annoying it is to constantly refer to ‘*rufa* group *Pterostylis*’. These species all have ‘flick up’ labella, outside the flowers grow in dry habitats and sexually attract long bodied flies in spring. How much easier it would be to recognise these as a separate genus. Then there are the tiny flowered ‘*parviflora* complex’. These grow in damp often-swampy sites, flower in autumn (mostly) and are pollinated by short-bodied flies, which are attracted by subtle odours of decadence. Another multi-flowered group is the ‘*longifolia* complex’.

“Then there are the ‘beardies’; single flowered species with bizarre plumed labella for which the pollination strategy is not yet understood. Altogether there may be as many as seven different genera or subgenera involved! The number of named species will be almost double that of ten years ago.”

This article was discussed in the June issue of the *Bulletin* of the Western Australian Native Orchid Study and Conservation Group. After paraphrasing the original article it finished “...The sentiments expressed are most welcome. However it would be great if we could have names for the many *Pterostylis* aff. ‘Whatever’ we are confronted with. Almost 20 years ago a name was bandied about for a short-eared aff. *nana* that grew in the Gngangara pine plantation. It still hasn’t been promulgated.

We wait in hope eternal.”

(*Sounds familiar doesn’t it – D. McC.*)

**2**The July issue of the *Bulletin* of the WANOSCG carried an article on *Salep* by Margaret Collins.

“Something completely different from the usual article about orchids: a recipe. This is for those who have too many orchid tubers and don’t know what to do with them. I first heard about *Salep* many years ago from Kingsley Dixon while I was working at Kings Park and Botanic Gardens

“More recently when perusing a cookbook that I have owned for some time and that contains many strange recipes, such as Roast Camel Hump, I came across these and thought they may be of interest. Originally *Salep* was made in Turkey using local terrestrial orchid tubers and is used as flavouring for ice cream. I haven’t personally tried *Salep*, having neither spare tubers nor the inclination, but it may be adapted to our terrestrial species: certainly our species are edible as aboriginal people used some common species as food.

*Salep*: Orchid tubers are collected after the above-ground parts are dead, washed to remove soil, then crushed to provide a floury, gelatinous substance (*Salep*) which is then used as a flavouring.

*Salep jelly*: Mix, without allowing to curdle, a teaspoon of *Salep* in 1 cup (200 ml) of water, cook over a low heat, keep at boiling point for 4 or 5 minutes. Add a little cinnamon and 4 tablespoons of Tamarind or Pineapple syrup and allow to cool.

*Salep soup*: Mix, without allowing to curdle, a teaspoon of *Salep* in 1 cup (200 ml) of unsalted vegetable stock, add a spring of tarragon and a teaspoon of Soya Sauce.

Note 1: This has been used for Birds Nest Soup. Note 2: A use for your excess *Pterostylis curta* bulbs.”

**3** *Caleana major* by Rex Johnson is from the July ANOS Victoria *Bulletin*.

"About 10 years ago, just after I began to realise there were orchids other than Cymbidiums, I visited a small craft shop in the fishing and tourism town of St. Helens (on the east coast of Tasmania). I noticed a nice ceramic pot on the counter supporting two stems of a little duck-like flower. I mentioned to the chap in attendance that I thought they were orchids, and asked where did they come from? He also thought they were orchids, but didn't know the name of them. However, he told me where he lived (just out of town) and said they were growing near his house.

"As I am now taking a keen interest in our native orchids, I went back to St. Helens last year to search for *Caleana major*. I think it was Christmas time when I saw the flowers in the craft shop, and I knew roughly the area where the chap lived, so during the winter last year I trudged for miles (should be kilometres) through the bush looking for the leaves which should have been grown during autumn. I didn't find any, so I gave up and left it until Christmas time. On the 6<sup>th</sup> of December 1998, I went back to the same area and, without losing sight of the car, there they were – hundreds of 'em! This little flower sits on top of a very thin, wiry stem about 250 mm tall. There may be up to five buds on a stem (usually two or three) but mostly only one flower open at a time, and usually not all the flowers open. I found this species to be very common in some areas but not in close-formed colonies.

"The *Caleana major* flower is non-resupinate – one of the "upside-down" flowers - with the dorsal sepal close to the stem at the bottom and the labellum at the top. Like so many other orchids, its labellum is very sensitive and is quick to snap shut when touched. The whole flower is about 20 mm high and with the broad downward

column, swept back sepals and helmet-shaped labellum, it is really easy to see how it got the common name of "Flying Duck Orchid".

"The reddish-brown, waxy looking flowers were not easy to see amongst the bracken and needles of the She-oaks but, once found (you have to lower yourself to their level) they are surely one of the treasures of the orchid world (*All good NOGgers know this applies to almost all our natives and makes for interesting views – DMCC*).

"A similar orchid, *Caleana minor*, (Small Duck Orchid), was flowering in the same locations. *Caleana minor* has a smaller flower than *Caleana major*, is more green, has a shorter stem, and has a labellum pointing somewhat higher. The "head" (labellum) of the Small Duck Orchid is covered with small, shiny, reddish calli (small bumps). Although *Caleana major* is said to flower in early summer and *C. minor* to flower later (mid summer), I found many plants of both species flowering at the same time. When I did find leaves of *C. major* they were bluish-grey on the top and reddish maroon on the underside. The leaves of *C. minor* are all green, but they are usually withered and most have disappeared by flowering time. *Caleana major* leaves are about 60 mm long, 5 mm broad, deeply channelled and, although curved, are quite upright. *Caleana minor* leaves are about half the length and half the width.

"Both species seem to prefer sandy soils, and while some were growing in full sun, most were growing in partial shade, although receiving sufficient light. *Caleana minor* seems to colonise more than *C. major*.

"From now on I will have no objections to taking my wife to visit her mother at St. Helens at Christmas time – as long as I can take time off to admire these gems of the orchid world."

## Directory of Australasian Native Orchid Society groups

### NEW SOUTH WALES

- ANOS Central Coast, PO Box 3010 Erina 2250. ph. (02) 4373-1186. Meetings 8pm, 2nd Wed. each month, Temple Kiely Visitors Centre, Department of Agriculture Station, Research Rd., Narara.
- ANOS Far North Coast, PO Box 949 Ballina 2478. ph. (02) 6686-6303. Meetings 7.30pm, 1st Thur. each month. Ballina High School, Ballina.
- ANOS Hawkesbury, 50 Holborrow Ave, Hobartville 2753. ph. (02) 4577-5154. Meetings 8pm, 1st Fri. each month. Horticulture Centre, University of Western Sydney, Richmond.
- ANOS Illawarra, 13 Eleanor Ave, Oak Flats 2529 ph. (02) 4256-1608. Meetings 7pm, 2nd Tue. each month. Legacy House, Market St, Wollongong.
- ANOS Macarthur & District, 28 Crispsparkle Dr., Ambarvale 2560. ph. (02) 9727-4491. Meetings 8pm, 3rd Wed. each month. Narellan Community Hall, Queen St, Narellan.
- ANOS Mid-North Coast, PO Box 128 Taree 2430. ph. (02) 6553-1012. Meetings 7.30pm, last Fri. each month. (Held at Taree or Wauchope - telephone Secretary for details).
- ANOS Newcastle, PO Box 273 Kotara Fair 2289. ph. (02) 4942-1362. Meetings 7.30pm, 4th Tues. each month. Warners Bay Community Hall, Cnr John & Lake Sts., Warners Bay.
- ANOS Port Hacking, PO Box 359 Gymea 2227. ph. (02) 9524-9996. Meetings 8pm, 4th Wed. each month. Presbyterian Church Hall, 391/393 Port Hacking Rd. Sth., Caringbah.
- ANOS Sydney, 4 Regal Ave, Kings Langley 2147. ph. (02) 9624-1768. Meetings 8pm, 3rd Fri. each month. Senior Citizens Hall, Baulkham Hills Community Centre (off Conie Ave) Baulkham Hills. ANOS Warringah, PO Box 421 Forestville 2087. ph. (02) 9416-4306. Meetings 8pm, 3rd Tue. each month. Community Hall, Starkey St, Forestville.

### QUEENSLAND

- ANOS Kabi, PO Box 42 Aspley 4034. Meetings

- 7.30pm, 2nd Tues monthly (except Jan.). Bald Hills Memorial Hall, Gympie Rd., Bald Hills.
- ANOS Logan, PO Box 2103 Crestmead 4132. Meetings 8pm, 2nd Wed. each month. Logan City Works Depot, Cnr. Kingston & Smith Sts., Woodridge.
- ANOS Mackay & DiSt, 98 Belford Rd., Andergrove. ph. (07) 4955-1631. Meetings 8pm, 2nd Thur. each month. Andergrove Neighbourhood Centre, Belford Rd., Mackay.
- ANOS Townsville, PO Box 1147 Aitkenvale 4814. ph. (07) 4778-4311. Meetings 8pm, 1st Tue. each month. Townsville Orchid Society Hall, Pioneer Park (opp. Willows Shopping Centre), Thuringowa.
- ANOS Wide Bay, PO Box 15 Tinana 4650. Meetings 7.30pm, 4th Wed. each month. Neighbourhood Centre, Bazaar St, Maryborough.
- Native Orchid Society of Toowoomba, PO Box 2141 Toowoomba 4350. Meetings 7.30pm, 1st Fri. each month. Red Cross Hall, Hall Lane (off Neil St) Toowoomba.

### VICTORIA

- ANOS Geelong, 1 Elizabeth St, Belmont 3216. ph. (03) 5243-4286. Meetings 8pm, 2nd Wed. each month. Uniting Church Hall, Regent St, Belmont.
- ANOS Victoria, PO Box 285 Cheltenham 3192. ph. (03) 9954-7692. Meetings 8pm, 1st Fri. each month. Demonstration Hall, Burnley Horticultural College, Swan St, Burnley.

### SOUTH AUSTRALIA

- Native Orchid Society of South Australia, PO Box 565 Unley 5061. ph. (08) 8356-7356. Meetings 8pm, 4th Tue. each month. St Matthews Hall, 67 Bridge St, Kensington.

### WESTERN AUSTRALIA

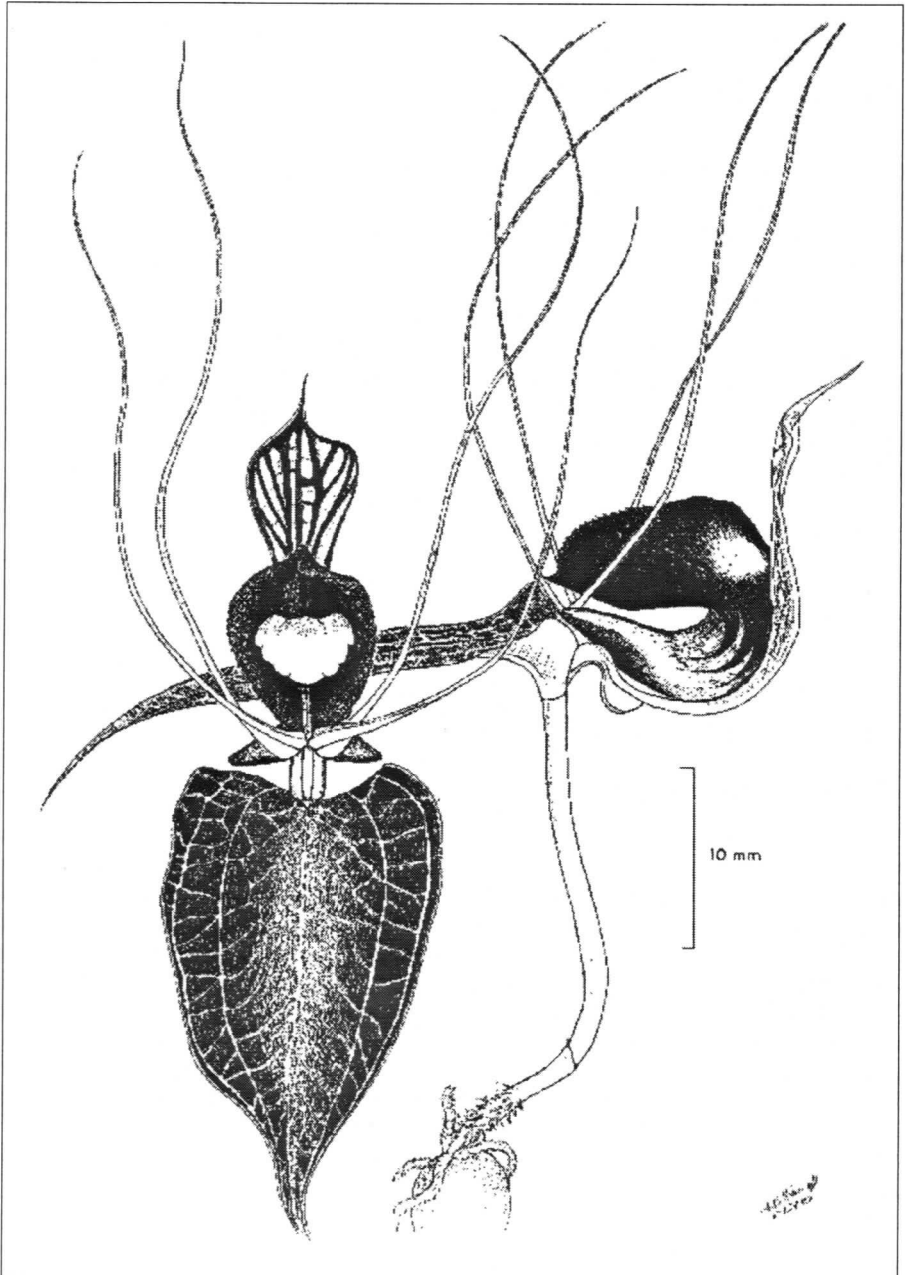
- ANOS Western Australia, 95A Ewen St, Scarborough 6019. ph. (08) 9341-6709. Meetings 8pm, 2nd Mon. each month. Wilson Community Hall, Brailbrise Rd., Wilson.

### NEW ZEALAND

- ANOS New Zealand, 20 Fairlands Ave, Water-view, Auckland, New Zealand.
- ANOG, 51A Glenharrow Ave, Christchurch, New Zealand. ph. (03) 342-7474.
- NZNOG.

# Close relations: orchids like ours

*Corybas mankiensis* van Royen, from Papua New Guinea: drawing by N.H.S. Howcroft





## Historical reprints

From Colenso W. *Trans. N.Z.Inst.* 1890; XXII: 490.

### *Thelymitra fimbriata*, sp. nov.

Plant rather slender, stem 11 in. high, erect, flexuous. Leaves: basal 0, cauline 1, 3 in. from base, sheathing, linear-acuminate, sub-acute,  $6\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. wide at base, flat, sub-coriaceous, dark-coloured (with stem and bracts) when dry. Two large cauline bracts, equidistant, nerved, their tips very acuminate much produced and flexuous. Flowers 5, distant in a loose raceme, their pedicels  $\frac{1}{2}$  in. long (the length of ovary); floral bract broadly ovate (almost sub-orbicular), 8-9 lines long, 5 lines wide, many-nerved, the top suddenly acuminate, acute. Perianth  $1\frac{1}{4}$  in. diameter, violet; with darker pencillings, much veined; veins branching. Dorsal sepal broad; petals narrower than lateral sepals; lip longer and very narrow. Column truncate, with small toothed wings shorter than staminodia; staminodia, largely fimbriate; fimbriae spreading, irregular, flat, flexuous, sometimes forked at their extreme tips; anther ovate, pointed.

*Hab.* Open fern lands, interior; also in similar situations, Fortrose, Invercargill, whence specimen received in a packet: 1888.

*Obs.* A species having affinity with *T. pulchella* Hook. f., but differing in its larger and otherwise-coloured flowers, its long narrow labellum, and remarkably fimbriate staminodia, &c.

From Cheeseman TF. *Manual of the NZ Flora*, 1906. Appendix: Additions and corrections, 1151-2.

### *Thelymitra pachyphylla*, Cheesem. n. sp.

Stem tall, stout or rather slender, 9-18 in. high or more. Leaf shorter than the stem, usually very thick and fleshy, grooved and channelled, variable in breadth, sometimes as much as  $\frac{3}{4}$  in. across; empty bracts 2 or 3, thick and fleshy, sheathing. Flowers 3-6 or more in a raceme, large and handsome,  $\frac{3}{4}$ -1 in. diam., blue-purple. Sepals and petals oblong-ovate or broadly oblong, subacute. Column short, stout, about half as long as the perianth, the wing continued behind the anther but hardly as long as it, 3-lobed; middle lobe short, broad, indistinctly hood-shaped, truncate at the top with an even or denticulate margin; lateral lobes longer than the middle one, erect or pointing forwards, flattened, the margins divided into numerous simple or branched fimbriae. Anther broad; connective produced into a stout horn-like point which usually overtops the middle lobe of the column-wing.

**SOUTH ISLAND:** Nelson—Vicinity of Westport, *Townson!* Westland—Kumara, *Brame!*

This has doubtless been confused with *T. pulchella*, from which, however, it totally

differs in the structure of the column. In *T. pulchella* the middle lobe of the column-wing is much shorter than the anther while the lateral lobes are barely as long as it, and are irregularly toothed or jagged, and not at all ciliate or fimbriate. In the present species the middle lobe almost equals the anther, while the lateral lobes are longer than it, and are provided with numerous fimbriae. *T. longifolia* differs in the smaller flowers, much longer and distinctly hooded middle lobe of the-column-wing, and in the shorter lateral lobes, which terminate in a dense rounded brush of white cilia.

*From Colenso W. Trans. & Proc. N.Z. Inst. 1884; XVII: 248-9.*

*Caladenia variegata*, sp. nov.

Plant erect, 6-12 inches high, glandular-pubescent; pubescence pink-tipped; scape red, sub-rigid not succulent, slender above leaf, stoutish below, arising from a thickened node, having three clasping membranous acute sheaths, one at base enclosing scape and leaf, one at middle 6-8 inches long, and one close under ovarium; root rather long, stoutish, ending in a long white tuber as big as a pea. Leaf single, ½-1 inch from base, 6-8 inches long, 1-2 lines wide, linear-acuminate, thickish, glabrous, channelled, green on upper and purplish-red on under surface, slightly ciliate at edges, and very sparsely pubescent underneath on the lower portion with long weak glandular hairs. Flower single on top of scape, (one specimen only, out of nearly forty obtained, bore two flowers, both springing from within the upper sheath and pedicelled,) perianth spreading, more than ½ inch diameter; dorsal sepal green, arched, sub-oblong-obovate, obtuse and apiculate at apex, produced, glabrous above; lateral sepals pinkish, oblong, apiculate, larger than petals, 3-nerved; petals pink, oblong-lanceolate, apiculate, falcate; lip sessile; disk with two longitudinal rows of bright-yellow stipitate glands having large globular heads, extending from inner part of middle lobe down into the throat, with smaller glands scattered on each side, and one or two at the margin of extreme base of the middle lobe; the two lateral lobes are transversely banded with light-purple, margins white, rounded at tips; middle lobe deltoid, deeply crenulate, recurved, bright yellow; column winged throughout, green, pubescent at top, transversely banded below with light purple, similar to lateral lobes; anther acute, tip subulate, margin finely fimbriate. Ovary 8-9 lines long, linear-obovate, sulcate, densely glandular-pubescent.

*Hab.* Plentifully, but only in one spot, among mosses on fallen and rotten *Fagus* trees, and on the ground alongside, in rotten vegetable soil, shady woods, top of a high hill near Norsewood, County of Waipawa; December, 1883: *W.C.*

*Obs.* A species closely allied to the two known New Zealand species, *C. minor* and *lyallii*; and also to several Tasmanian and Australian species--*C. carnea*, *alata*, and *angustata*: but while serving naturally to unite them differing from them in all important characters. *C. minor*, which is so common at the north (Bay of Islands), on clayey open hills among fern (*Pteris esculenta*) and *Leptospermum* scrub, I have never met with in these southern parts.