



Journal

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Editorial

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A loose-leaf treatment of the New Zealand orchids?

There is a lot of support out there for Tim Funnell's idea in the last issue of the Journal, so let's work on it. You will recall that he suggested -

"...a loose leaf binder with pages the size of the Journal. On some pages have photos and line drawings of flowers and whole plants. The pages would be numbered, e.g. Section A page 1: one species/variety per page, e.g. *Thelymitra decora* on one page, *T. formosa* on another, *T. hatchii* on another and so on. These would be permanent pages as the plants themselves don't change that much. What does change is man's commentary on them: this could be on temporary pages, replacing only those pages that need to be changed, e.g. name changes, new information, etc. The initial cost would be a little high, but yearly replacement and supplementary pages wouldn't. We would have one book instead of several and it would be up to date on a yearly basis".

I think we should take up that very good idea. It could be combined with the final report of the Mapping Scheme to produce a book of colour

photographs, distributions, and descriptions that would form the basis for a very adequate field guide.

It would have to be done in parts, and by subscription to cover costs as we go.

It would take some time to put together, and it would take the combined efforts of photographers, writers and artists.

What I need now are offers of contributions. Specifically this means that a contributor would offer to write a descriptive piece on a number of species (preferably on a whole genus),

and would provide or arrange for drawings and/or photographs. There would be variation in style with different writers, artists and photographers, but I think this would add quality rather than detract from it. I will set the ball rolling with *Acianthus*. Dan Hatch has already written on *Corybas*. Bruce Irwin has offered his drawings. If you would be willing to offer the written work on a genus, or photographs, write to me now, and I will suggest a style and format. For a start, would someone be willing to tackle *Pterostylis*? - Ed.

Notes

¶ Rave (well, modestly rave) reviews from across the Tasman for our NZNOG book: Lorraine Marshall writes of *The NZ orchids: natural history and cultivation* in the ANOS Victorian Group *Bulletin*,

"This is an excellent publication for the novice orchidophile as it spans a wide range of interest areas, extending its scope well beyond cultivation methods. The authors are also careful to point out the importance of conserving species in the wild, advising that all collections must be not only legal, but never undertaken in the case of rare plants, as this can affect the survival of the species. They also point out that even in cases where collections can be undertaken, it is rarely necessary to collect tuberoids as these are not

needed for identification or herbarium specimens.

"I found the thumbnail sketches of early botanists informative as it gives meaning to the often cryptic abbreviations listed beside taxa in botanical works.

"The chapters on botanical drawing, orchid biology and pollination offer useful information and encourage others to follow up and add to the work already undertaken by others in the field of orchidology.

"The chapter on the collection of herbarium specimens offers sound advice and, when used in conjunction with field observations and photography, should provide a good ground in methodology.

"Cultivation methods listed vary little

from those used locally and the cultural notes on specific species may be useful to people attempting to grow New Zealand orchid species.

"As a whole, I found the book enjoyable, easy to read, and informative. One minor criticism - I believe the chapters on photography could have been more usefully combined to provide an overview of the subject. Apart from that, a useful v book and one I would recommend."

¶ Max Gibbs points out that "Flower 15" pantyhose packs have a *Thelymitra* pictured on the wrapper - from Arthur's Pass - a rather faded photograph, probably of *T. decora*: it's gratifying to find that our orchids are being exploited commercially, but even more so to hear of Max's preoccupation with pantyhose - Ed.

¶ Dan Hatch writes on *Pterostylis cardiostigma*: "In October 1947 Frank Bartlett sent me a specimen of *Pterostylis* from Eave's Bush, Orewa. This looked like a *banksii* in bud but had a cordate stigma. There was only one specimen and there didn't seem to be any other plants in the area. There was nothing I could do with so little material so I tagged the specimen *P. banksii* var. *cordata* and tossed it to one side. Mrs Young's recent discovery of *P. cardiostigma* near Warkworth jogged my memory. It would seem that *P. cardiostigma* is not a newcomer to the mid-north."

¶ He adds, "re the digging up and transplanting of *Thelymitra aemula*: this species is strongly mycorrhizal and cannot be cultivated with any success. The removal of plants from Katikati recorded by Bruce Irwin amounts to

straight out destruction of what is already a rare species."

¶ He writes further, "The *Pterostylis* on page 7 (Journal No.37) looks a bit like *P. areolata*. This species often sports both flat and twisted labella tips - cf *Trans.Roy.Soc.N.Z. 1953; 80: 323 & t.72.*" (reprinted in *NZNOG Historical Series 1989; 3:156.-Ed*)

¶ Ron Maunder writes (5 April) regarding Australian terrestrials (but it would apply to NZ ones as well), "The problems of deflasking - use of fogging etc - can largely be overcome by removing the lid of the flask, adding 1/4in sterile/boiled water and leaving the plants in the agar for ten days or so. The flask needs to be in a shaded greenhouse situation or inside on top of the fridge out of the sun. An occasional spray or mist with a water bottle (old oven cleaner ones well cleaned out are excellent) when passing also helps. The leaves gradually develop an epidermis and harden off. Plants are removed, washed, dipped in a fungicide solution, and planted. This method should work instead of employing a fogger which is beyond most nurseries even!"

¶ Noeleen Clements reports (23 April) the first of the new season's orchids - *Pterostylis brumalis* in Russell State Forest, and - "They will be flowering over many weeks yet". Bruce Irwin also reports *P. brumalis* "already flowering up Auckland way so another season is almost upon us."

Original Papers

***Corybas rotundifolius* (J.D. Hooker) H.G. Reichenbach 1871**

by E.D. Hatch, Laingholm

Syn. *Nematoceras rotundifolia* J.D. Hooker 1853
Corysanthes matthewsii Cheeseman 1899
Corybas "aff *unguiculatus*"

Lectotype - determined by MA.Clements 16 March 1983 Kew Herbarium W. Colenso #740, consisting of a single plant with an unopened flower, and 11 orbicular-apiculate leaves on long petioles.

1846: Collected by Colenso on 2 April, near the village of Puehutai, on the upper Manawatu River, growing on the sides of "clayey hills". (Letter to Sir William Hooker 31 July 1846).

1853: These were described by J.D. Hooker in *Flora NZ* 1: p251 as *Nematoceras rotundifolia*, with the added note - "I regret not having expanded flowers of this curious little plant. Those I have in bud resemble *N. oblonga* in size and form of the perianth".

1864: (Thomas Kirk applied the name *rotundifolia* in error to plants which were actually *rivularis*. (See Hatch: *Corybas rivularis* - the wet one, *NZNOG Newsletter* 1986. 17: March, p3.)

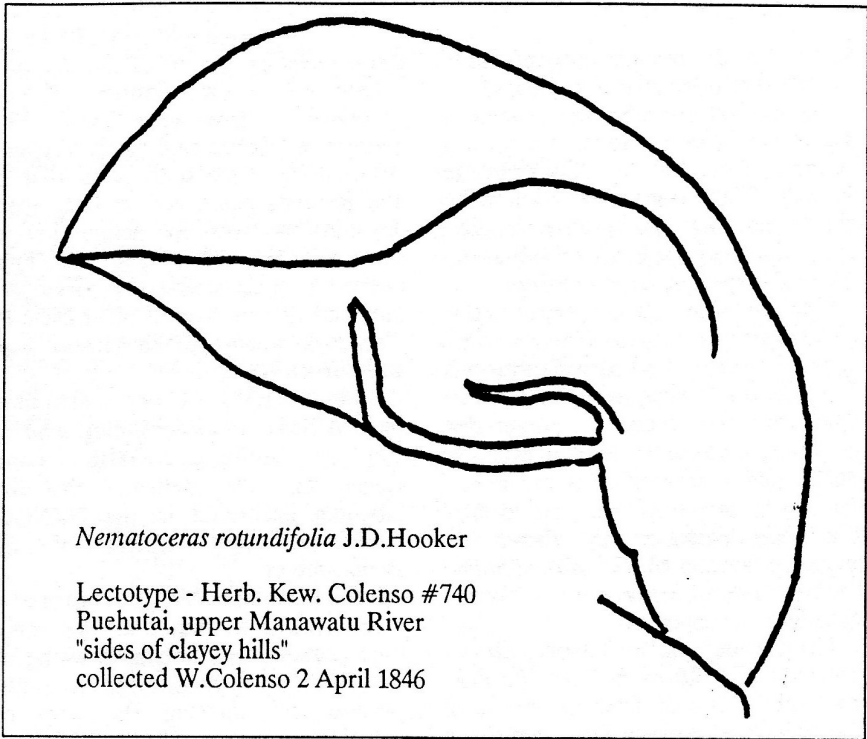
1897: E.W. Matthews found *rotundifolius* s.s. near Kaitaia, and in

1899: Cheeseman described it as *Corysanthes matthewsii*, naming it oddly enough, for R.H. Matthews, and this was the name by which it was known until

1945: when H.M.R. Rupp, who was "lumping", included it in the related *C. unguiculatus*, and this was followed by Hatch and later by L.B. Moore. Still in 1945 Hatch pondered the *rotundifolius/oblongus* problem and came to the erroneous conclusion that the two were identical.

1987: Mark Clements expressed the opinion that *rotundifolius* was in fact *carsei*. I dug into the Colenso records and decided that this was ecologically improbable. *C. carsei* is a plant of raised peat bogs - and "clayey hillsides" were not a logical habitat.

1988: Anthony Wright obtained for me from Kew, a photo of the type of *rotundifolius*. I copied this onto a slide, threw an enlarged image onto the screen and traced round the outlines of the flower



1989: (see figure). Clements was correct up to a point - the plant had to be either *carsei* or "aff. *unguiculatus*", but the ecological problem still remained. I passed this problem over to Brian Molloy and in January he received from Kew the original Colenso specimen, examined it carefully and confirmed my opinion that it was in fact the plant described by Cheeseman as *Corysanthes matthewsii*.

In 1989 also the Australians, who had been "lumping for years, began to "split" again and our plant, while obviously related to *unguiculatus*, was reinstated as an endemic species and given the tag-name "aff *unguiculatus*". It can now assume its proper title *Corybas rotundifolius*. This species is now confined to scrub and light forest between Warkworth and the North Cape, but specimens in herbaria suggest that it once extended much further south.

The labellum of *Gastrodia cunninghamii*
by Bruce Irwin, Tauranga

How much can orchids vary, yet still be regarded as one particular species?

Let us first consider the species to which we belong: Maori, Europeans, Asiatics, short, tall, fat, thin, beautiful, homely. There is great variation within the human race, yet because we share basic similarities, we all belong to one particular species, *Homo sapiens*.

Similarly we must expect that individuals of an orchid species may vary. Whenever I prepare illustrations, I try to use typical specimens rather than extreme forms. Sometimes, however, because of limited available specimens, I draw what is recognised later as an atypical form. The form of *Gastrodia cunninghamii* shown on pages 28 and 45 of *The New Zealand orchids: natural history and cultivation* falls into this category.

The drawing was made from a flower collected at Rotorua in 1985. Because the pattern of calli down the centre of the labellum appeared distinct from that of *G. sesamoides*, I thought it could be a useful diagnostic character

for the species.

Later I drew flowers of *G. cunninghamii* from near Waihi. The pattern of labellar calli on these plants differed quite markedly from that of the Rotorua plant, and in fact, apart from colour, was not unlike that of both *G. sesamoides* and *G. "long column"*. This season the Goodgers supplied flowers from a plant close to Tauranga which agreed closely with those from Waihi.

Brian Molloy kindly examined pickled flowers of *G. cunninghamii* at Botany Institute, DSIR Land Resources. He confirmed that the labellum illustrated in the NZNOG book was not typical of *G. cunninghamii*.

I think it desirable to illustrate a more typical labellum, at the same time pointing out that the drawing of the Rotorua flower serves a useful purpose by showing the sort of variation we can expect within a species.

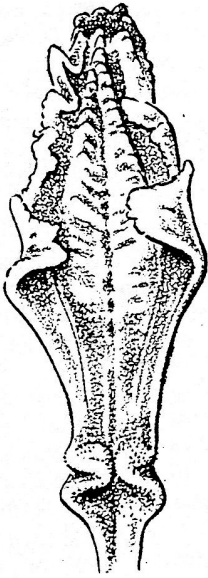
Systematic & Ecological Relationships of South Pacific Floras

A conference to be held in Auckland,
22-27 November 1991, and organised by the Australian Systematic Botany
Society and the New Zealand Botanical Society.

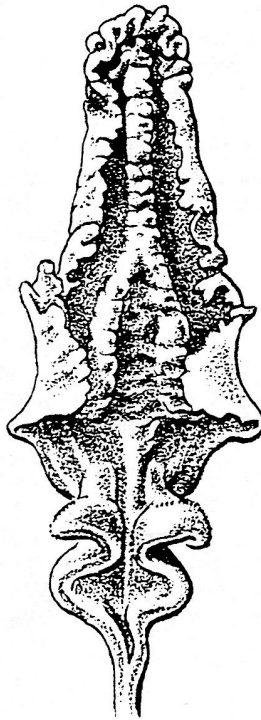
Write for details to Anthony Wright, Auckland Institute and Museum, Private
Bag, Auckland

Gastrodia cunninghamii

Median calli appear as two quite separate ridges sloping evenly to centre line.



Labellum from book - specimen from Rotorua.



Calli fused about half way below that point forming two separate narrow ridges, the inner margins dropping steeply, NOT sloping gently to centre lobe.

Labellum from Tauranga Dec 1990 agreeing closely with Waihi specimens

A provisional comparison of four *Pterostylis* species- *P. graminea*, *P. "rubricaulis"*, *P. montana*, and *P. "aff. montana"*.

by Bruce Irwin, Tauranga

Frequently when a group of orchid enthusiasts finds colonies of *Pterostylis* aff. *montana* or of *P. "rubricaulis"*, someone (even a professional botanist) will identify them as *P. graminea*.

In NOG Newsletter 21, Lucy Moore set out a very useful comparison between *P. graminea* and *P. "rubricaulis"*. The following is a provisional attempt to compare four *Pterostylis* species which are easily confused.

NZNOG members are invited to submit observations which may clarify or contradict my statements.

Pterostylis graminea

(1) Distinguished from *P. "rubricaulis"* by the dorsal sepal having few veins, widely spaced near midline, forming obvious "windows". Base of dorsal

not inflated from behind. Leaves usually strictly erect.

(2) From *P. montana* and "*aff. montana*" by its smaller size - the rectangular labellum not constricted near the apex and its midrib not prominent. By the junction of the lateral sepals not forming an obvious inward facing "jug spout".

P. "rubricaulis"

Distinguished from *P. graminea* - see (1) above.

(3) From *P. montana* by the arching leaves. Flower more lightly built with longer lateral sepals with apices inrolled to form tubular caudae. Stigma longer

oval.

(4) From *P. "aff. montana"* by the reddish, longer and more heavily built labellum with very strongly raised midrib.

P. montana

Distinguished from *P. graminea* - see (2) above.

From *P. "rubricaulis"* - see (3) above.

(5) From *P. "aff. montana"* by the more chunky, often bronze/green flower. The much shorter lateral sepals separating from the dorsal sepal while still in bud and with wider apices which are not inrolled but flat and may droop with maturity. (Note the lateral sepals of *P. "aff. montana"* are usually + /- inrolled to form a partial tube but may be flat). The column almost reaching bend of dorsal sepal. The labellum much stouter, more twisted and with shorter basal appendage. Stigma short, prominent +/- heart-shaped. My drawing of the longitudinal section shows that close to its base the midline of the dorsal sepal is recessed, but above separates widely from the column. It should be noted that a fifth form of *Pterostylis*, *P. "linearis"* shows the same character. I am uncertain that this character is constant in *P. montana*.

P. "aff montana"

Distinguished from *P. graminea* - see (2) above.

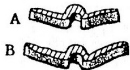
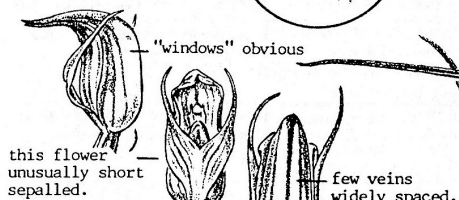
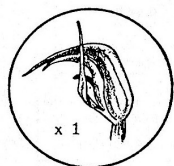
From *P. "rubricaulis"* - see (4) above.

From *P. montana* - see ((5) above.

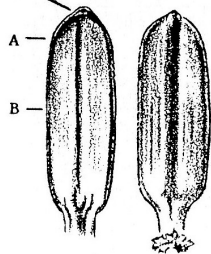
PTEROSTYLIS — INTERIM COMPARISON
GRAMINEA "RUBRICAULIS" MONTANA MAY 1991
 "AFF MONTANA"

Stem.	green	OFTEN RED-MAY BE GRN.	green	green.
leaves	4-6 erect	usually fewer arching	usually erect	usually arching
flowers	resemble P. banksii but very much smaller	ditto somewhat larger.	chunky appearance often bronze/green	almost indistinguishable from "rubricaulis"
dorsal sepals	FEW VEINS. PROMINENT "WINDOWS" IN VICINITY OF COLUMN	more veins. closely spaced in vicinity column. no obvious window. inflated	short blunt. not greatly exceeding column. centreline may be recessed inflated near base	veining tending toward that of graminea
lateral sepals	variable. well exceeding galea OR barely equal	usually well exceeding galea	SEPARATING FROM DORSAL WHITE STILL IN BUD. VERY SHORT. FLAT. MAY DROOP WHEN MATURE.	usually well exceeds galea apex somewhat rolled or flat.
sinus of lat. sepals	about 90° LITTLE INCURVED ALMOST NO "JUG SPOUT"	c. 160° incurved forming inward facing 'jug spout'	inward facing "jug spout"	c. 90° inward-facing "jug spout"
petals	narrow. shorter than dorsal occas. NOT greatly so	narrow - much shorter than dorsal sepal	wide almost to tip. barely shorter than dorsal	much as in "rubricaulis"
labellum	oblong ± obtuse. midrib not prominent. apex not constricted. usually shorter than column. green	more tapering. apex constricted. usually twisted to right. usually longer than column. <u>RED / BRONZE.</u>	heavily built. apex constricted. almost always strongly twisted to right usually longer than column. Us. dark green	lightly built. more taper than montana. apex not usually constricted. sometimes twisted to right usually taller than column
labellum appendage	long straight slender	shorter. heavier	short. bent	long. straight. slender (Ruapehu species curved)
column	2/3 galea height. slender	slender	> 3/4 GALEA HEIGHT. STOUT WIDE GAP BETWEEN COLUMN AND CENTRELINE OF DORSAL	2/3 galea height slender.
column wings	narrow. about 1/3 column height	narrow about 1/2 column height	broader. about 1/2 column height	short. lower lobe very short & narrow.
stigma	narrow/oval. top level with base column wing.	Oval. top partly covered by column wing	SHORT. PROMINENT ± HEART SHAPED. TOP JUST COVERED BY COLUMN WING	narrow/oval. usually below level of col. wing (opposite wing Ruapehu)
DISTRIB	North I. S.I. Stewart I.	Kauri Forest N. of Lat 38°	SOUTH OF 39° - S.I. & St.I.	N.I., S.I. Stewart I.

Pterostylis graminea

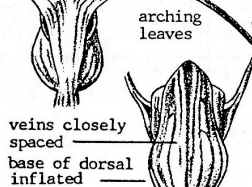
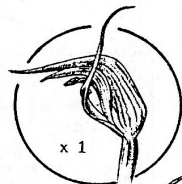


midrib not prominent
apex not constricted



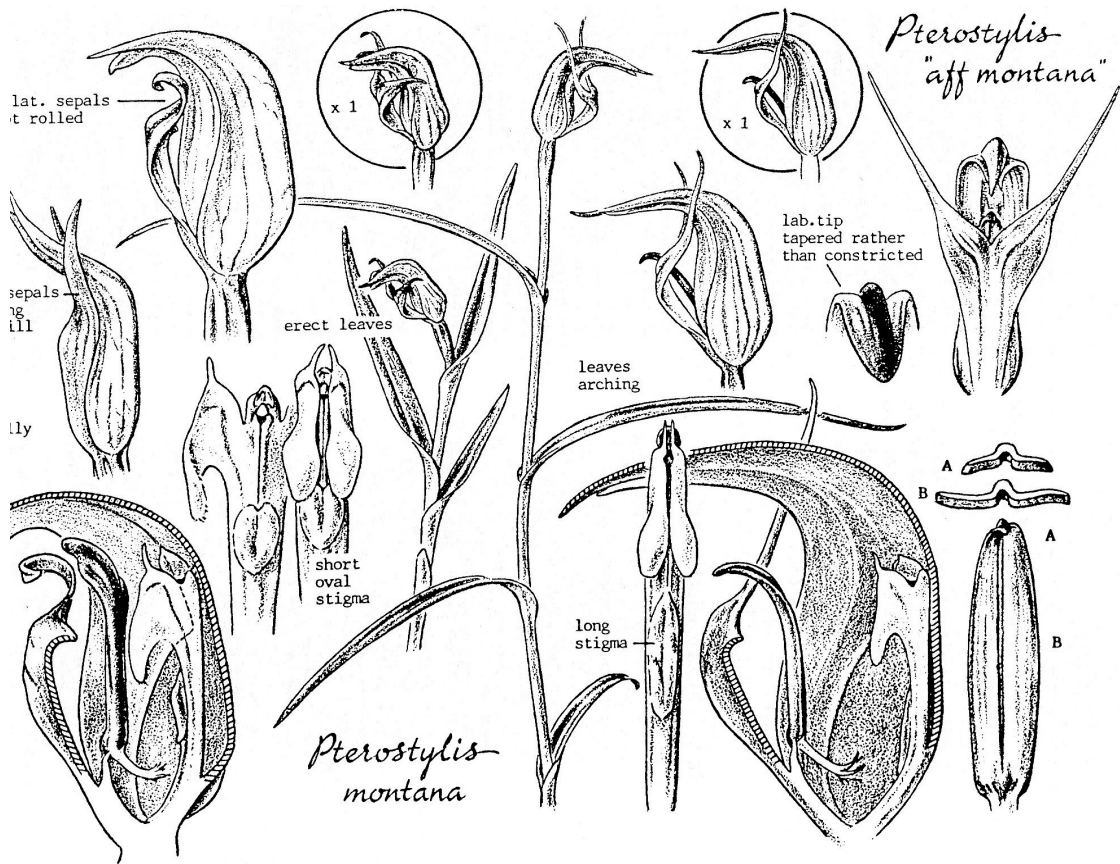
erect leaves

P. rubicaulis



apex constricted





Mapping

The New Zealand Native Orchid Group's mapping scheme is supported by Lottery Science.

Here is an up-to-date collation of mapping reports. The Mapping Scheme ends in 1992, and we are seeking Lottery Science support towards the publication of the results in early 1993.

If you have observed species not included here, please send in a report of the Ecological Region to the editor.

Orchids by Ecological Region

- 1 Kermadec:
- 2 Three Kings:
- 3 Te Pahi: *Acianthus sinclairii*, *Bulbophyllum pygmaeum*, *Caladenia alata*, *C. minor*, *C. "green column"*, *Calochilus herbaceus*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. cheesemani*, *C. cryptanthus*, *C. oblongus*, *C. trilobus*, *C. "aff. unguiculatus"*, *Cyrtostylis oblonga*, *C. reniformis*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia sesamoides*, *Microtis parviflora*, *M. unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum pumilum*, *P. "aff. patens"*, *Pterostylis alobula*, *P. liana*, *P. plumosa*, *P. trullifolia*, *P. "rubricaulis"*, *Spiranthes sinensis*, *Thelymitra aemula*, *T. carnea*, *T. longifolia*, *T. mathewsii*, *T. pauciflora*, *T. pulchella*, *T. tholiformis*, *T. "aff. ixioides"*, *T. "darkie"*, *T. "rough leaf."*
- 4 Aupouri: *Acianthus sinclairii*, *Caladenia alata*, *C. minor*, *C. "green column"*, *Calochilus herbaceus*, *Corybas oblongus*, *C. trilobus*, *C. "aff. unguiculatus"*, *Corybas "A"*, *Cryptostylis subulata*, *Cyrtostylis oblonga*, *C. reniformis*, *Earina mucronata*, *Microtis parviflora*, *M. unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *P. pumilum*, *Pterostylis plumosa*, *P. trullifolia*, *Spiranthes sinensis*, *Thelymitra aemula*, *T. carnea*, *T. longifolia*, *T. malvina*, *T. pauciflora*, *T. pulchella*, *T. "aff. ixioides"*, *T. "Ahipara"*, *T. darkie*, *T. "rough leaf"*.
- 5 Hokianga: *Acianthus sinclairii*, *Bulbophyllum pygmaeum*, *B. tuberculatum*, *Caladenia alata*, *C. minor*, *C. "green column"*, *Calochilus herbaceus*, *C. paludosus*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. cheesemani*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *C. "aff. unguiculatus"*, *Cyrtostylis oblonga*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia sinensis*, *Thelymitra aemula*, *T. carnea*, *T. longifolia*, *T. malvina*, *T. pauciflora*, *T. pulchella*, *T. tholiformis*, *T. "aff. ixioides"*, *T. "darkie"*, *T. "rough leaf"*.
- 6 Eastern Northland: *Acianthus sinclairii*, *Bulbophyllum pygmaeum*, *B. tuberculatum*, *Calochilus paludosus*, *Corybas acuminatus*, *C. "aff. unguiculatus"*, *C. cheesemani*, *C. oblongus*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Pterostylis alobula*, *P. banksii*, *P. brumalis*, *P. graminea*, *P. "rubricaulis"*, *P. trullifolia*, *Thelymitra aemula*, *T. carnea*, *T. longifolia*, *T. pauciflora*, *T. pulchella*.
- 7 Poor Knights:
- 8 Kaipara: *Acianthus sinclairii*, *Caladenia catenata*, *C. minor*, *C. "green column"*, *Chiloglottis cornuta*, *C. acuminatus*, *C. oblongus*, *C. trilobus*, *Cyrtostylis oblonga*, *Earina mucronata*, *Microtis parviflora*, *M. unifolia*, *Orthoceras novae-zeelandiae*, *Pterostylis banksii*, *P. "rubricaulis"*, *Thelymitra aemula*, *T. longifolia*, *T. pauciflora*, *T. "aff. ixioides"*, *Yuania australis*.
- 9 Auckland: *Acianthus sinclairii*, *Bulbophyllum pygmaeum*, *B. tuberculatum*, *Caladenia catenata*, *C. iridescens*, *C. minor*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. carsei*, *C. cheesemani*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *C. "aff. unguiculatus"*, *Cyrtostylis oblonga*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia minor*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum pumilum*, *Pterostylis alobula*, *P. banksii*, *P. brumalis*, *P. cardiostigma*, *P. graminea*, *P. plumosa*, *P. trullifolia*, *P. "rubricaulis"*, *Thelymitra aemula*, *T. carnea*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*, *T. "intermedia"*, *Yuania australis*.
- 10 Coromandel: *Acianthus sinclairii*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Caladenia iridescens*, *C. minor*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. cheesemani*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Cyrtostylis*

- oblonga*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. minor*, *G. sesamoides*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum nudum*, *P. pumilum*, *P. "aff. patens"*, *Pterostylis alobula*, *P. banksii*, *P. brumalis*, *P. graminea*, *P. patens*, *P. trullifolia*, *P. "rubricaulis"*, *Thelymitra aemula*, *T. carnea*, *T. formosa*, *T. longifolia*, *T. pauciflora*, *T. pulchella*, *T. "aff. ixioides"*, *Yuania australis*.
- 11 Waikato: *Acianthus sinclairii*, *Bulbophyllum pygmaeum*, *Calochilus robertsonii*, *Chiloglottis cornuta*, *Corybas carsei*, *C. cheesemani*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Pterostylis alobula*, *P. banksii*, *P. trullifolia*.
- 12 Taimui: *Acianthus sinclairii*, *Bulbophyllum tuberculatum*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. trilobus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Orthoceras novae-zeelandiae forma viride*, *Pterostylis banksii*, *Thelymitra longifolia*.
- 13 Northern Volcanic Plateau: *Acianthus sinclairii*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *B. tuberculatum*, *Caladenia alata*, *C. catenata*, *C. iridescens*, *Calena minor*, *Calochilus paludosus*, *C. robertsonii*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. minor*, *G. sesamoides*, *Microtis oligantha*, *M. parviflora*, *M. unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *Pterostylis alobula*, *P. banksii*, *P. cardiostigma*, *P. graminea*, *P. trullifolia*, *P. "rubricaulis"*, *P. "aff. montana"*, *Spiranthes sinensis*, *Thelymitra aemula*, *T. carnea*, *T. decora*, *T. formosa*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. "aff. ixioides"*.
- 14 Whakatane: *Drymoanthus adversus*, *Pterostylis graminea*, *Thelymitra longifolia*.
- 15 Western Volcanic Plateau: *Corybas trilobus*, *Dendrobium cunninghamii*, *Earina autumnalis*, *E. mucronata*, *Gastrodia minor*, *Prasophyllum "aff. patens"*.
- 16 Central Volcanic Plateau: *Acianthus sinclairii*, *Caladenia catenata*, *Chiloglottis comma*, *Corybas acuminatus*, *C. cheesemani*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. minor*, *G. sesamoides*, *Microtis oligantha*, *M. parviflora*, *M. unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *Pterostylis alobula*, *P. banksii*, *P. trullifolia*, *Thelymitra cyanea*, *T. decora*, *T. longifolia*, *T.*
- 17 Eastern Volcanic Plateau: *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia catenata*, *C. iridescens*, *C. lyallii*, *Calochilus robertsonii*, *Chiloglottis cornuta*, *Chiloglottis gunnii*, *Corybas macranthus*, *C. trilobus*, *Gastrodia minor*, *Microtis unifolia*, *Prasophyllum colensoi*, *Pterostylis banksii*, *P. cardiostigma*, *P. graminea*, *P. patens*, *Thelymitra longifolia*, *T. pauciflora* (?).
- 18 Tongariro: *Acianthus viridis*, *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia catenata*, *Caladenia iridescens*, *C. lyallii*, *Earina mucronata*, *Gastrodia cunninghamii*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *P. "aff. patens"*, *Pterostylis banksii*, *P. cardiostigma*, *P. graminea*, *P. micromega*, *P. patens*, *Thelymitra cyanea*, *T. decora*, *T. formosa*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*, *T. "aff. ixioides"*.
- 19 Raukumara: *Earina autumnalis*, *E. mucronata*, *Microtis pauciflora*, *Pterostylis graminea*.
- 20 East Cape: *Acianthus sinclairii*, *Bulbophyllum pygmaeum*, *Corybas macranthus*, *C. trilobus*, *Cyrtostylis reniformis*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *E. aestivalis*, *Orthoceras novae-zeelandiae*, *Pterostylis alobula*, *P. banksii*, *P. trullifolia*,
- 21 Urewera: *Bulbophyllum pygmaeum*, *Caladenia catenata*, *Chiloglottis cornuta*, *Corybas macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Pterostylis banksii*, *Thelymitra longifolia*,
- 22 Wairoa: *Acianthus sinclairii*, *Cyrtostylis reniformis*, *Corybas oblongus*, *C. macranthus*, *C. trilobus*, *Drymoanthus adversus*, *Earina mucronata*, *Microtis unifolia*, *Pterostylis alobula*, *P. banksii*, *Pterostylis trullifolia*, *Thelymitra longifolia*,
- 23 King Country:
- 24 Taranaki: *Bulbophyllum pygmaeum*, *Caladenia catenata*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Pterostylis alobula*, *P. banksii*, *P. montana*, *Thelymitra longifolia*.
- 25 Egmont: *Adenochilus gracilis*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Caladenia catenata*, *C. lyallii*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *Microtis unifolia*,

- Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *Pterostylis banksii*, *P. cardiostigma*, *P. humilis*, *P. irsoniana*, *P. montana*, *P. patens*, *P. venosa*, *Thelymitra hatchii*, *T. longifolia*.
- 26 Maowhango:
- 27 Kaimanawa: *Caladenia catenata*, *Chiloglottis cornuta*, *Corybas trilobus*, *Earina mucronata*, *Prasophyllum colensoi*, *Pterostylis banksii*, *P. patens*, *Thelymitra cyanea*, *T. longifolia*.
- 28 Ruahine: *Chiloglottis cornuta*, *Corybas trilobus*, *Dendrobium cunninghamii*, *Earina mucronata*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Pterostylis patens*, *P. venosa*.
- 29 Hawke's Bay: *Corybas macranthus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *Pterostylis banksii*, *P. graminea*, *Thelymitra hatchii*, *T. longifolia*.
- 30 Rangitikei: *Chiloglottis cornuta*, *Corybas trilobus*.
- 31 Manawatu: *Corybas trilobus*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*.
- 32 Manawatu Gorge:
- 33 Pahiatua: *Dendrobium cunninghamii*, *Earina autumnalis*, *E. mucronata*, *Thelymitra longifolia*,
- 34 Eastern Hawke's Bay:
- 35 Eastern Wairarapa:
- 36 Wairarapa: *Acianthus sinclairii*, *Corybas macranthus*?, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Pterostylis banksii*, *P. graminea*, *Thelymitra longifolia*.
- 37 Aorangi:
- 38 Tararua: *Acianthus sinclairii*, *A. viridis*, *Bulbophyllum pygmaeum*, *Caladenia catenata*, *C. iridescens*, *C. lyallii*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. cheesemanii*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Cyrtostylis oblonga*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. sesamoides*, *Lyperanthus antarcticus*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *Pterostylis alobula*, *P. australis*, *P. banksii*, *P. cardiostigma*, *P. foliata*, *P. graminea*, *P. montana*, *P. plumosa*, *P. trullifolia*, *Thelymitra cyanea*, *T. decora*, *T. formosa*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*, *T. aff. ixioides*".
- 39 Sounds-Wellington: *Acianthus sinclairii*, *A. viridis*, *Bulbophyllum pygmaeum*, *Caladenia catenata*, *C. iridescens*, *Chiloglottis comma*, *Corybas acuminatus*, *C. cheesemanii*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. sesamoides*, *Microtis parviflora*, *M. unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *P. pumilum*, *Pterostylis alobula*, *P. banksii*, *P. cardiostigma*, *P. foliata*, *P. graminea*, *P. montana*, *P. plumosa*, *P. trullifolia*, *Thelymitra cyanea*, *T. decora*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*.
- 40 Richmond: *Acianthus sinclairii*, *Adenochilus gracilis*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Caladenia catenata*, *C. iridescens*, *C. lyallii*, *Chiloglottis cornuta*, *Corybas oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia minor*, *G. sesamoides*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *P. pumilum*, *Pterostylis alobula*, *P. australis*, *P. banksii*, *P. foliata*, *P. graminea*, *P. montana*, *P. trullifolia*, *Thelymitra carnea*, *T. decora*, *T. hatchii*, *T. longifolia*, *T. pauciflora*.
- 41 Wairau: *Corybas rivularis*, *Dendrobium cunninghamii*, *Earina autumnalis*, *E. mucronata*, *Gastrodia sesamoides*, *Orthoceras novae-zeelandiae*.
- 42 Inland Marlborough:
- 43 Molesworth: *Earina mucronata*,
- 44 Clarence:
- 45 Kaikoura:
- 46 Northwest Nelson: *Acianthus sinclairii*, *A. viridis*, *Adenochilus gracilis*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Caladenia catenata*, *C. iridescens*, *C. lyallii*, *Calochilus paludosus*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. cheesemanii*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. minor*, *Lyperanthus antarcticus*, *Microtis oligantha*, *M. parviflora*, *M. unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *P. pumilum*, *Pterostylis alobula*, *P. australis*, *P. banksii*, *P. foliata*, *P. graminea*, *P. humilis*, *P. irsoniana*, *P. micromege*, *P. montana*, *P. oliveri*, *P. plumosa*, *P. trullifolia*, *P. venosa*, *Thelymitra carnea*, *T. cyanea*, *T. decora*, *T. formosa*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*, *T. "aff. ixioides"* *Yoania australis*.
- 47 Nelson: *Acianthus sinclairii*, *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia catenata*, *C. iridescens*, *C. lyallii*, *Calochilus paludosus*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. cryptanthus*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. minor*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *P. nudum*, *P. pumilum*, *Pterostylis alobula*, *P. areolata*, *P. australis*, *P. banksii*, *P. foliata*, *P. graminea*, *P. humilis*, *P. irsoniana*, *P. montana*, *P. nana*, *P. oliveri*, *P. trullifolia*, *Thelymitra carnea*, *T. cyanea*, *T. decora*, *T. formosa*, *T.*

- hatchii*, *T. longifolia*, *T. pauciflora*.
- 48 North Westland: *Adenochilus gracilis*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Caladenia catenata*, *C. lyallii*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. cryptanthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *Microtis parviflora*, *M. unifolia*, *Orthoceras novae-zeelandiae*, *Prasophyllum colensoi*, *P. nudum*, *Pterostylis banksii*, *P. cardiostigma*, *P. graminea*, *P. irsoniana*, *P. montana*, *thelymitra cameo*, *T. cyanea*, *T. dentata*, *T. longifolia*, *T. pauciflora*, *T. pulchella*.
- 49 Spenser *Acianthus viridis*, *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia catenata*, *C. lyallii*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. minor*, *Microtis unifolia*, *Prasophyllum colensoi*, *P. nudum*, *Pterostylis australis*, *P. banksii*, *P. graminea*, *P. irsoniana*, *P. oliveri*, *Thelymitra carnea*, *T. cyanea*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*.
- 50 Whataroa: *Adenochilus gracilis*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. trilobus*, *D. cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *Lyperanthus antarcticus*, *Microtis unifolia*, *Prasophyllum colensoi*, *P. nudum*, *Pterostylis australis*, *P. banksii*, *P. graminea*, *P. irsoniana*, *P. montana*, *Spiranthes sinensis*, *Thelymitra longifolia*.
- 51 Aspiring: *Adenochilus gracilis*, *Aporostylis bifolia*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Gastrodia cunninghamii*, *G. minor*, *Lyperanthus antarcticus*, *Microtis oligantha*, *Prasophyllum colensoi*, *Pterostylis banksii*, *P. montana*, *P. venosa*, *Thelymitra cyanea*, *T. formosa*, *T. longifolia*, *T. pulchella*.
- 52 Lowry: *Chiloglottis cornuta*, *Chiloglottis gunnii*.
- 53 Hawdon: *Acianthus viridis*, *Aporostylis bifolia*, *Caladenia lyallii*, *Chiloglottis cornuta*, *Corybas rivularis*, *C. trilobus*, *Lyperanthus antarcticus*, *Pterostylis graminea*, *P. montana*, *P. oliveri*, *Thelymitra hatchii*.
- 54 Puketeraki: *Chiloglottis cornuta*, *Corybas trilobus*, *Pterostylis oliveri*.
- 55 Canterbury Foothills: *Caladenia catenata*, *C. lyallii*, *Chiloglottis cornuta*, *Corybas cryptanthus*, *C. macranthus*, *C. rivularis*, *C. trilobus*, *Gastrodia cunninghamii*, *G. minor*(?), *Microtis unifolia*, *Prasophyllum colensoi*, *Pterostylis areolata*, *P. banksii*, *P. irsoniana*, *P. montana*, *P. tristis*, *P. aff. cynocephala*, *Thelymitra cyanea*, *T. formosa*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*.
- 56 Canterbury Plains: *Pterostylis tristis*, *P. aff. cynocephala*, *Thelymitra hatchii*, *T. longifolia*, *T. pauciflora*.
- 57 Banks: *Gastrodia cunninghamii*.
- 58 D'Archaic: *Caladenia lyallii*, *Corybas rivularis*, *Gastrodia cunninghamii*, *Prasophyllum colensoi*, *Pterostylis aff. montana*, *Thelymitra hatchii*, *T. longifolia*.
- 59 Heron:
- 60 Tasman: *Caladenia lyallii*.
- 61 Pareora:
- 62 Wainomo:
- 63 MacKenzie: *Prasophyllum colensoi*
- 64 Waitaki:
- 65 Kakanui: *Caladenia lyallii*, *Chiloglottis cornuta*, *Corybas macranthus*, *C. trilobus*, *Gastrodia cunninghamii*, *G. minor*, *Microtis oligantha*, *M. unifolia*, *Pterostylis banksii*, *P. foliata*, *P. graminea*, *P. montana*, *P. aff. montana*, *Thelymitra cyanea*, *T. decora*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*.
- 66 Lakes: *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia catenata*, *Chiloglottis cornuta*, *Corybas macranthus*, *C. rivularis*, *C. trilobus*, *C. "short tepals"*, *Earina mucronata*, *Gastrodia cunninghamii*, *G. minor*, *G. "long column"*, *Lyperanthus antarcticus*, *Microtis oligantha*, *M. unifolia*, *Prasophyllum colensoi*, *Pterostylis australis*, *P. banksii*, *P. venosa*, *P. aff. cynocephala*, *Thelymitra cyanea*, *T. formosa*, *T. longifolia*, *T. pauciflora*, *T. pulchella*.
- 67 Central Otago: *Lyperanthus antarcticus*, *Pterostylis aff. cynocephala*.
- 68 Lammerlaw: *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia lyallii*, *Chiloglottis cornuta*, *Corybas macranthus*, *C. rivularis*, *C. trilobus*, *Gastrodia minor*, *Prasophyllum colensoi*, *Thelymitra pauciflora*.
- 69 Otago Coast: *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia catenata*, *C. lyallii*, *Chiloglottis cornuta*, *Corybas macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus "spotted leaf"*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. minor*, *Lyperanthus antarcticus*, *Microtis oligantha*, *M. unifolia*, *Prasophyllum colensoi*, *Pterostylis areolata*, *P. australis*, *P. banksii*, *P. graminea*, *P. montana*, *P. venosa*, *P. aff. cynocephala*, *P. aff. montana*, *Thelymitra cyanea*, *T. formosa*, *T. hatchii*, *T. longifolia*, *T. pauciflora*, *T. pulchella*.
- 70 Catlins: *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia lyallii*, *C. minor*, *Chiloglottis cornuta*, *Corybas macranthus*, *C. oblongus*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus "spotted leaf"*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *Lyperanthus antarcticus*, *Microtis unifolia*, *Prasophyllum colensoi*,

- Pterostylis australis*, *P. banksii*, *P. graminea*, *P. montana*, *P. venosa*, *P. "aff montana"*, *Thelymitra cyanea*, *T. hatchii*, *T. pulchella*.
- 71 Olivine: *Spiranthes sinensis*, *Thelymitra longifolia*.
- 72 Fiord: *Adenochilus gracilis*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Caladenia catenata*, *C. minor*, *C. lyallii*, *Chiloglottis comma*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Lyperanthus antarcticus*, *Microtis unifolia*, *Prasophyllum colensoi*, *Pterostylis australis*, *P. banksii*, *P. graminea*, *Thelymitra cyanea*, *T. longifolia*.
- 73 Mavora: *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia lyallii*, *C. minor*, *Chiloglottis comma*, *Corybas macranthus*, *C. trilobus*, *Gastrodia cunninghamii*, *G. minor*, *G. "long column"*, *Microtis oligantha*, *M. unifolia*, *Prasophyllum colensoi*, *Pterostylis banksii*, *Thelymitra longifolia*, *T. pulchella*.
- 74 Waikaia:
- 75 Gore:
- 76 Southland Hills: *Corybas trilobus*, *Thelymitra pauciflora*.
- 77 Te Wae Wae: *Acianthus viridis*, *Adenochilus gracilis*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Caladenia lyallii*, *C. minor*, *Chiloglottis comma*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus "spotted leaf"*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *Lyperanthus antarcticus*, *Microtis unifolia*, *Prasophyllum colensoi*, *Pterostylis banksii*, *P. venosa*, *Thelymitra cyanea*, *T. hatchii*, *T. longifolia*, *T. pulchella*.
- 78 Makarewa: *Chiloglottis cornuta*, *Corybas oblongus*, *Drymoanthus "spotted leaf"*, *Gastrodia minor*, *G. "long column"*, *Microtis oligantha*, *M. unifolia*, *Prasophyllum colensoi*, *Pterostylis australis*, *P. banksii*, *P. graminea*, *P. venosa*, *Thelymitra cyanea*, *T. hatchii*, *T. longifolia*, *T. pulchella*.
- 79 Rakiura: *Acianthus sinclairii*, *Acianthus viridis*, *Adenochilus gracilis*, *Aporostylis bifolia*, *Bulbophyllum pygmaeum*, *Caladenia catenata*, *Caladenia lyallii*, *Chiloglottis comma*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. rivularis*, *C. trilobus*, *C. "short tepals"*, *Dendrobium cunninghamii*, *Drymoanthus "spotted leaf"*, *Earina autumnalis*, *E. mucronata*, *Gastrodia: cunninghamii*, *G. minor*, *G. "long column"*, *Lyperanthus antarcticus*, *Microtis oligantha*, *M. unifolia*, *Prasophyllum colensoi*, *Pterostylis banksii*, *P. graminea*, *P. irsoniana*, *P. montana*, *P. venosa*, *Thelymitra cyanea*, *T. hatchii*, *T. longifolia*, *T. pulchella*.
- 80 Chatham: *Acianthus sinclairii*, *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia catenata*, *Chiloglottis comma*, *Corybas acuminatus*, *C. macranthus*, *C. oblongus*, *C. trilobus*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Prasophyllum colensoi*, *Pterostylis australis*, *P. banksii*, *P. micromega*, *Thelymitra cyanea*, *T. longifolia*, *T. pulchella*.
- 81 Bounty:
- 82 Antipodes:
- 83 Auckland Is.: *Acianthus viridis*, *Aporostylis bifolia*, *Caladenia catenata*, *Chiloglottis cornuta*, *Corybas acuminatus*, *C. oblongus*, *C. rivularis*, *Lyperanthus antarcticus*, *Thelymitra longifolia*.
- 84 Campbell:
- 85 Macquarie:

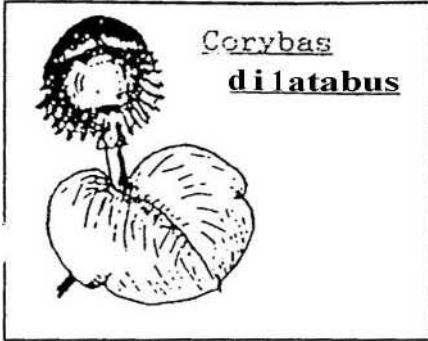
Australian Notes

The *Journal* of the Native Orchid Society of South Australia (March 1991) advertises "a small number of R.D. FitzGerald *Australian Orchids* lithographs" - price \$A40-\$A525 - I have a list -Ed.

Interestingly, the same issue carries a paper by Mark Phillips on Pine plantations and native orchids. Shades of Iwitahi -

"Visit the plantations of pine trees (*Pinus radiata*) and Stone pines (*Pinus*

pinasta) in the Adelaide Hills and you will quickly discover that native orchids thrive in this artificial habitat!



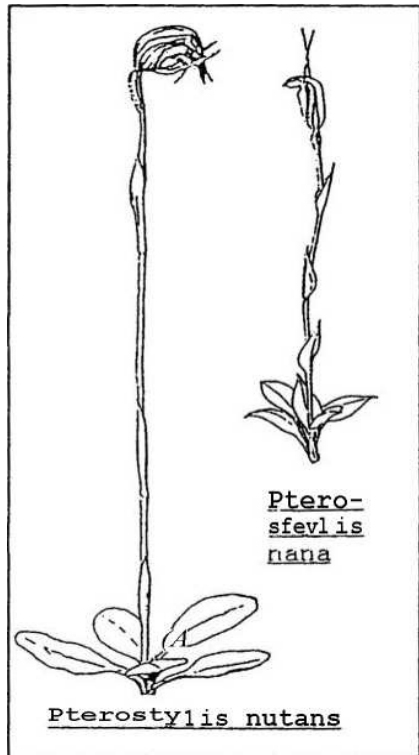
"Pine plantations are sometimes referred to as 'biological deserts' and they can be - especially when the trees are immature and planted in areas devoid of native plants.

"An immature pine plantation is usually so dense that very little light reaches the ground, the pine needles have not yet decayed and no understorey plants are present. After the first thinning at about ten years more light reaches the ground and by now the bottom layer of pine needles has begun to decay. Orchid seeds blowing into the forest have a chance of germinating and the only species to survive will be those that like deep shade, high humidity and deep leaf litter.

"The prime candidates are the helmet orchids *Corybas*.

"Once *Corybas diemenicus* enters the pine forest colonies quickly form - through vegetative increase and, because the whole forest floor is a uniform and ideal habitat, these colonies have a potential to reach a huge size. The fungus gnats which

pollinate the helmet orchids are common in the forest because of the frequency of fungi and so seed is set and the orchids can take over. However, native and introduced animals find very little food in the pine forest so once possums, rabbits, snails and some birds discover the orchids they are quickly eaten.



"As the forest matures further thinnings occur and other plants 'invade', the humus layer becomes thicker, the variety of soil micro-organisms increases, the cover

of now decayed needles thins, more sunlight reaches the ground and conditions are now suitable for a greater variety of orchids.

"After *Corybas* come the greenhoods (*Pterostylis*), also pollinated by fungus gnats and lovers of shade, i.e. *P. pedunculata*, *P. nutans* and *P. nana*.

"Next come the self-pollinated species such as *Thelymitra pauciflora*, *Microtis* spp., and *Caladenia* aff. *minor*. These species are not dependent on insects.

"Finally come insect-pollinated species which increase vegetatively.

"Some species never enter the pine forest - these are the ones dependent on sun-loving insects for pollination, and which do not increase vegetatively to form colonies.

"Pine plantations situated well away from any native forest may not be invaded at all.

An example of this is the Woods and Forest Jamestown block. The only orchids within twenty kilometres of Jamestown are *Thelymitra nuda* and *Pterostylis biseta*. Neither of these can survive in a pine forest.

If orchids such as *Microtis frutetorum* were deliberately introduced they would quickly spread but there is little value in doing this.

"Pine forests are also ideal places for introduction of eastern states' species such as *Chiloglottis* but this is hardly a wise move!

"*Monodenia*, too, may invade pine forests along woodsides but fortunately this has not happened although *Chiloglottis trapeziformis* now occurs Kuitipo and in pine forests of our southeast.

"A similar situation exists interstate."

- *What is the time sequence of invasion of New Zealand pine forests by orchids? In the south, Chiloglottis cornuta, Aporostylis bifolia, Adenochilus gracilis. In Iwitahi, a much greater variety - Ed.*

The Australian Orchid Foundation has published *Australian Orchid Research Vol.2* this year; it contains 108 new species of Australian orchids, mostly terrestrials, and two natural hybrids

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Historical Reprint

Count Ferdinand von Mueller's *Pterostylis silvicultrix*

Von Mueller wrote The Vegetation of the Chatham-Islands, sketched by F. Mueller (Melbourne, Government Printer) in 1864.

Among the orchids he described only *Earina mucronata*, *Pterostylis banksii* and *Chiloglottis traversii* (*cornuta*), but noted, "It is not improbable that still

other terrestrial orchids will be found existing in the Chatham-group". He was right.

But his description of *P. banksii* var. *silvicultrix* (from plants collected by W. Travers) has proved something of an enigma to later orchidologists -

PTEROSTYLIS BANKSII.

E. Brown, accord, to All. Cunn. in Bot. Mag. t. 3172 : All. Cunn. in Hook. Compan. to the Bot. Mag. u. 37G; Lindl. Gener. et Species Orchid. 388 ; J. Hook. Fl. Nov. Zeel. i. 248.

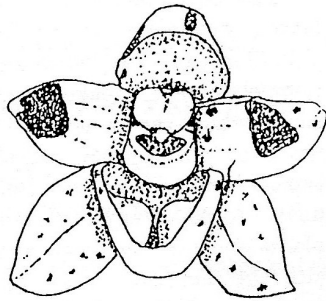
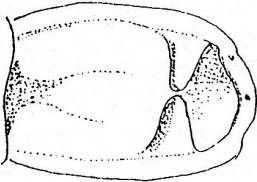
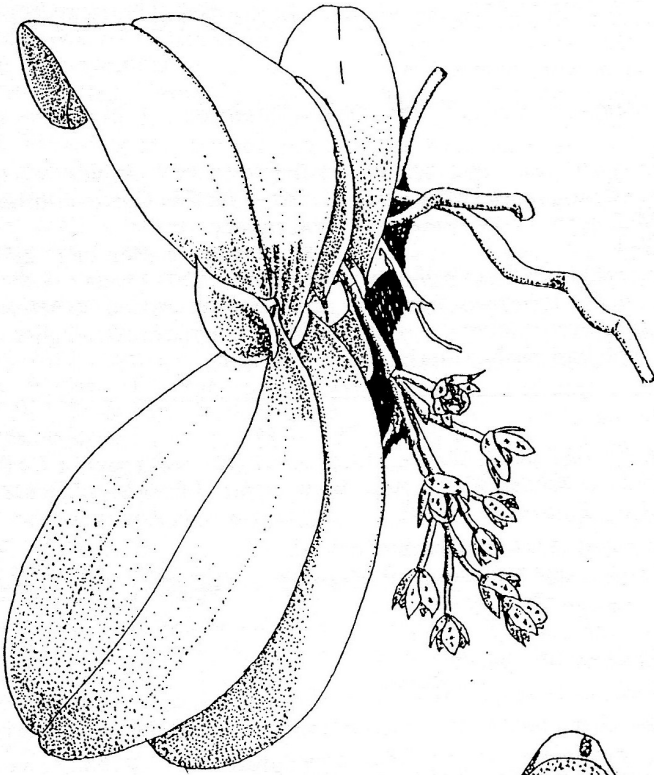
On grassy places of Chatham-Island.

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

Varietas silvicultrix.

Chatham-Island, in woods only.

The characters of this variety consist in broader and shorter leaves, which are verging from broad-ovate into lanceolate, only 1-2½" long, but ⅔-1" broad and acute but not acuminate, in proportionately broader sepals, of which the inner are lanceolate and simply acute, whilst the outer are hardly or little longer than these and never so much protracted into a narrow acumen as those of the typical form of *Pterostylis Banksii*. The author however has been unable to detect any important structural differences between these plants and has therefore not ventured to separate them as species, although middle-forms are missing in the collection. New Zealand specimens of *P. Banksii* prove that plant subject to considerable changes in its external form.



Drymoanthus adversus

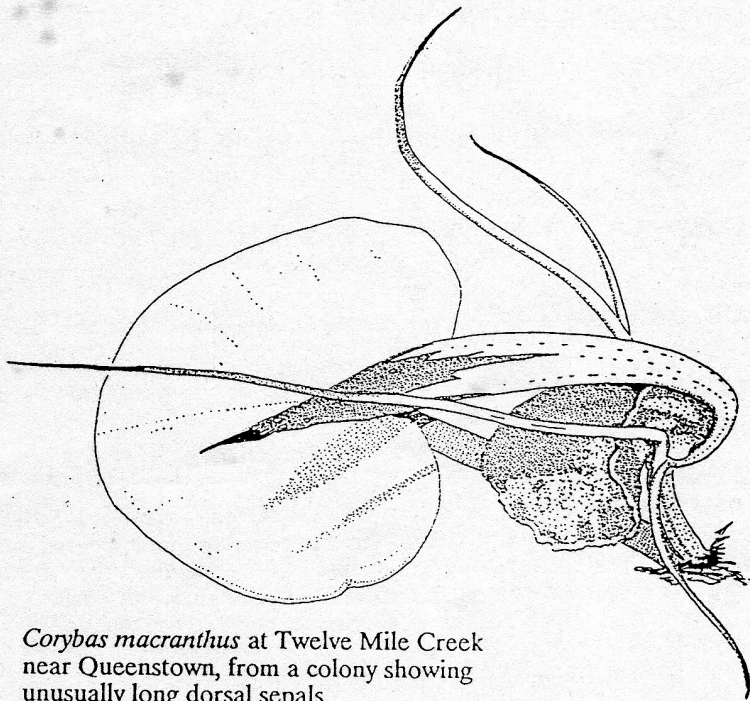
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Corybas macranthus at Twelve Mile Creek near Queenstown, from a colony showing unusually long dorsal sepals

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