

**WILD ORCHIDS
IN THE FAR SOUTH OF
NEW ZEALAND**



BY IAN ST GEORGE

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Published November 1992
by the New Zealand Native Orchid Group,
22 Orchard St, Wadestown, Wellington.
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ISBN 0-9597931-0-8.

Ian St George is a general medical practitioner who practised for eighteen years in Dunedin. He has been a member of the Otago Orchid Society, and the Otago Branch of the Royal Forest and Bird Society. He is a keen tramper, conservationist, photographer and illustrator of native orchids: the drawings in this book are his work.

He has been Convenor of the New Zealand Native Orchid Group since 1987, and is the editor of its *Journal*, to which he has also contributed a number of papers; he has written and edited nine booklets in the Group's *Historical Series*, and he edited (with Doug McCrae) its 1990 book, *The New Zealand orchids: natural history and cultivation*. Other botanical papers have appeared in the Australasian Native Orchid Society's *Journal*, *The Orchadian*, and in the *Turnbull Library Record*.

Cover: the pink fingers orchid, *Caladenia catenata* at Shag Point

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Thomas Kirk visited Stewart Island and the southern islands. School inspector Donald Petrie "sedulously investigated the eastern, central and southern portions of the province, ascending many of the mountains": he discovered *Gastrodia minor* in Dunedin. Science teacher at the Dunedin High Schools G.M. Thomson collected, observed, and wrote a number of papers on the pollination of native orchids: his diaries in the Hocken Library are full of orchid lore. There were many others.

Helen Dalrymple was a teacher at Otago Girls' High School, and in 1937 published *Orchid hunting in Otago, New Zealand*, the first of the regional orchid publications, with her own watercolours and drawings (a set still graces the wall of the Principal's office at the school). Sheila Natusch wrote *A bunch of wild orchids* (1968) on the Stewart Island plants. Hugh Wilson included thirty-two orchids in his *Field guide: Stewart Island plants* in 1982. All three illustrated their own work.

Dorothy Jenkin, a trained artist, added to the Island's rich orchid reputation by making prints of her exquisite orchid watercolours available to visitors.

* * *

The names of wild orchids pose some difficulties; the scientific names seem complex, and tend to change as taxonomic progress is made, but they are the best we have. Common names are not available for all species, and in any case differ among countries: the New Zealand lady's slipper is a *Dendrobium*, the European lady's slipper is a *Cypripedium*, and "slipper orchid" elsewhere refers to *Paphiopedilum*. The New Zealand spider orchids are *Corybas*, while the spider orchids of Australia are *Caladenias*. A number of observers have succumbed to the temptation to invent "common" names, but the results are generally unhelpful.

Maori names are no more definite. Piripiri refers to the bulb-leaf orchid (*Bulbophyllum pygmaeum*), but to three other plants as well (the common bidibidis); tutukiwi to many of the greenhoods; paratawhiti and maaikaika (and its variations) were used for many ground orchids whose tubers were used as food; pereii refers to the *Gastrodia*.

* * *

I do not have green fingers, and have long since abandoned attempts to grow orchids. In any case most natives do best where they are, and several are rare to the point that their removal is an ecological crime.

Many wild orchids will not transplant easily because of a complex and essential association with a soil fungus for absorbing nutrients. The fungus in turn needs its own ecological environment. Potential growers should

realise that for such orchid species eventual failure is guaranteed, and removal from the wild can never be justified.

"Progress", however, may mean disturbance of orchid habitat, and when a site is to be destroyed, taking them for home cultivation can be defended. There are grounds for arguing that learning the difficult art of cultivating wild orchids is a necessary step in their conservation.

I repeat for the various species Doug McCrae's advice on cultivation, though readers should refer to his chapter in the New Zealand Native Orchid Group's 1990 book *The New Zealand orchids: natural history and cultivation* for details. His "basic mix" for terrestrials is:

Medium-course sand (clean river sand is ideal; this provides drainage):

2 parts,

Soil/leafmould/humus (provides mineral food, retains moisture and helps the mycorrhizal fungi to provide food): 2 parts,

Sawdust (weathered sawdust or rotting wood): 1 part,

Bark (granulated 5-6mm bark provides drainage): 1 part.

* * *

At the first meeting of the Otago Orchid Club I attended, the late Janette West gave a talk on native orchids: what she had to say fascinated me. Here was something that would focus my interests -- photography, tramping, drawing, history, ecology. I became a devotee.

She was the most knowledgeable of local enthusiasts, and I valued her guidance and enthusiasm highly: she first introduced me to the outstanding orchid habitat at Shag Point, and her botanical knowledge of the Catlins area of South Otago was immense.

David McNaughton and Gordon Watson of Southland have a unique experience of the many orchids of the Waituna Lagoon and the Longwoods areas near Invercargill; they willingly shared this with me. Many others have told me about orchid localities, and I am grateful.

The notes on pollination given here are taken from the chapter by Brian Molloy in *The New Zealand orchids: natural history and cultivation*. Comments on occurrence and distribution are from my own observations.

I am grateful to Dan Hatch, Bruce Irwin, Peter Johnson and Brian Molloy for helpful comments, which I have incorporated in the text. I have valued their assistance, and that of the librarians at the University of Otago's Science and Hocken Libraries.

Ian St George
Dunedin

The drawings

All the drawings are of specimens I have found in the region, except those of *Acianthus sinclairii* (Wellington), *Corybas cryptanthus* and *Spiranthes sinensis* (Canterbury), and *Thelymitra formosa* (North Island).

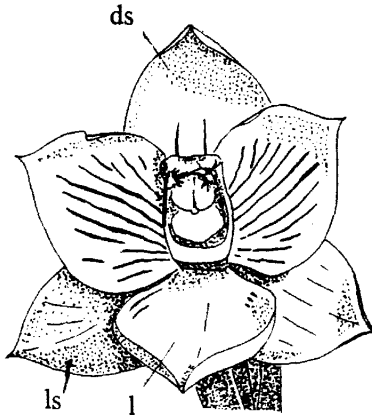
Orchid flowers are distinguished structurally from others by the arrangement of the flower parts. As with lilies, there are two whorls of three petals and three sepals: this arrangement is most obvious in the *Thelymitras*. But in most orchids the top (dorsal) sepal is more or less specialised into a hood over the flower, and the lowermost petal into a lip (labellum), which is often decorated: the *Caladenias* are good examples. In the greenhoods the petals and sepals are linked, and in the *Gastrodia* are fused, to form a tube.

The reproductive parts in the middle of the flowers of other plants are combined in the orchid into a unique central structure called the column, which bears the anther and pollinia (male) and the stigma (female). Various modifications of the column and of the other flower parts assist in insect-pollination or, more commonly in the south of New Zealand, self-pollination.

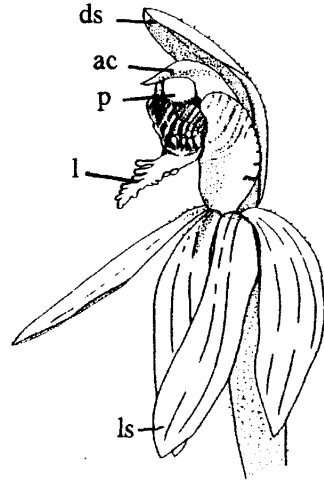
Key

(typical flower forms are shown
opposite, on page 5)

ac	= anther cap
c	= column
ca	= callus
co.a	= column arm
cw	= column wing
ds	= dorsal sepal
l	= labellum
la	= labellum appendage
ls	= lateral sepal
p	= pollinia
pl	= post-anther lobe
r	= rostellum
s	= stigma

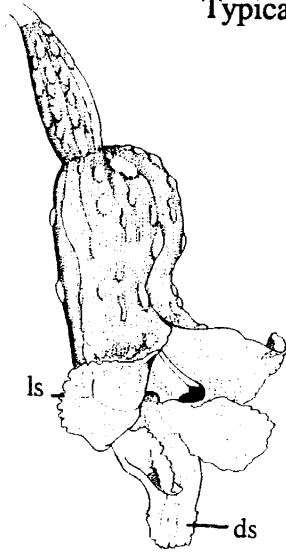


Thelymitra pulchella

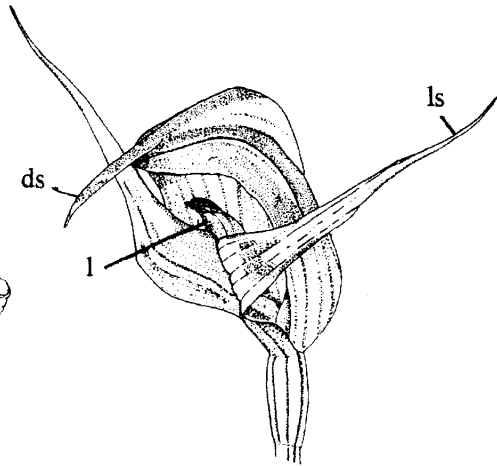


Caladenia species

Typical flower forms



Gastrodia cunninghamii



Pterostylis australis

Acianthus R. Brown, 1810

Of about twenty species worldwide (most of them from New Caledonia and Australia), New Zealand has two, one shared with Australia.

These are hairless ground orchids with several flowers, the hood above and arched over the column; the lip has two basal swellings; the column is semicircular in cross-section; the anther lies above a prominent stigma; mealy pollinia; the rostellum two-lobed. The single leaf is short and broad in the New Zealand species. Tubers spherical.

Acianthus sinclairii J.D. Hooker

The "pixie cap" is a tiny 2-10cm ground orchid, with a slender square stem bearing a heart-shaped leaf. There are one to ten green and red flowers less than a centimetre long. The hood is cupped over the column, the sepals pointed, the petals shorter, the lip broad, cupped and pointed.

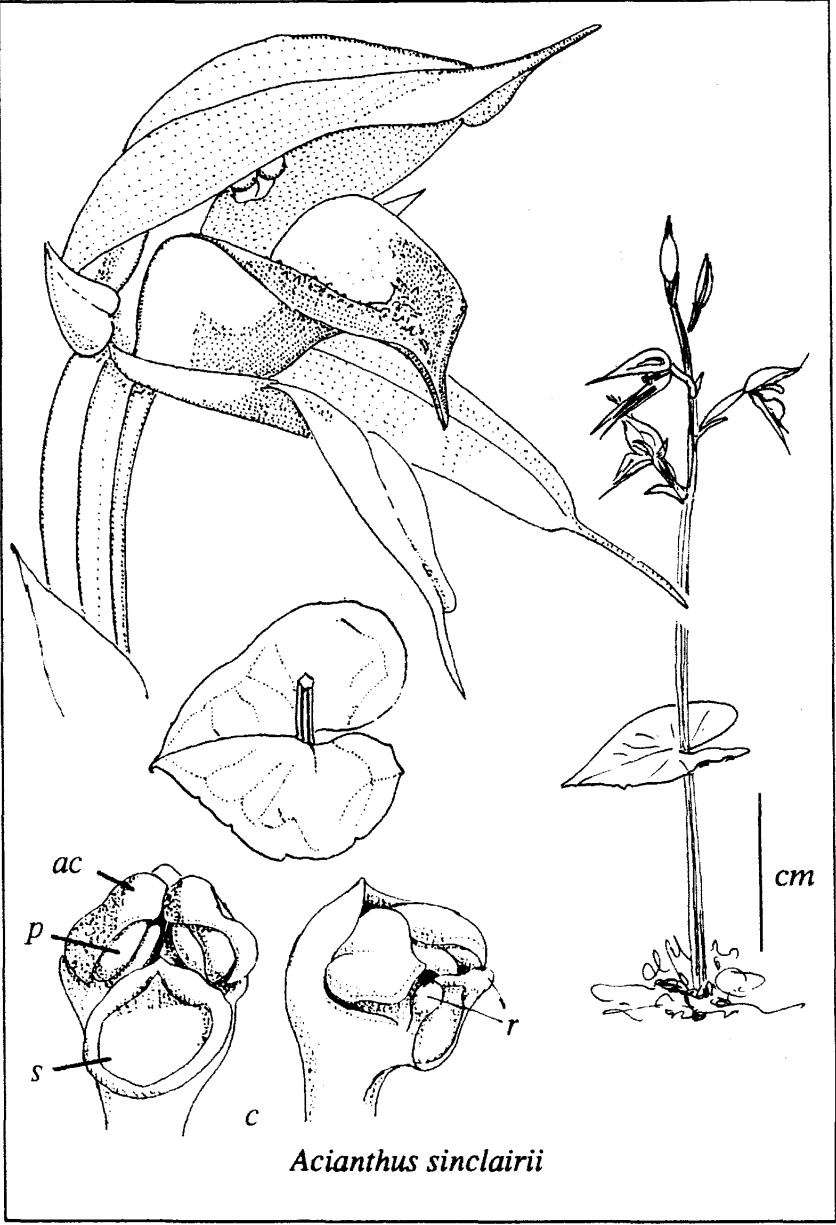
For many years thought to be a variety of the Australian *A. fornicatus*, *A. sinclairii* is now recognised as a New Zealand endemic. It is common everywhere in New Zealand except in Southland and Otago. It has long been known from Stewart Island, but it was not until 1983, when Colin Burrows found it in a fen to the south of Dome Mire near Te Anau, that it could reliably be said to be in the southern South Island.

Sheila Natusch has pressed specimens from Mason Bay on Stewart Island ("between Martin's Creek and Island Hill") collected by Dolly Leask in seed on 8 May 1966: "they are very plentiful but difficult to get down here in flower Have found them flowering from May till early October". I saw it there under light scrub, in seed in early August 1990. It has also been reported from the Mt Anglem track and Port Pegasus on Stewart Island.

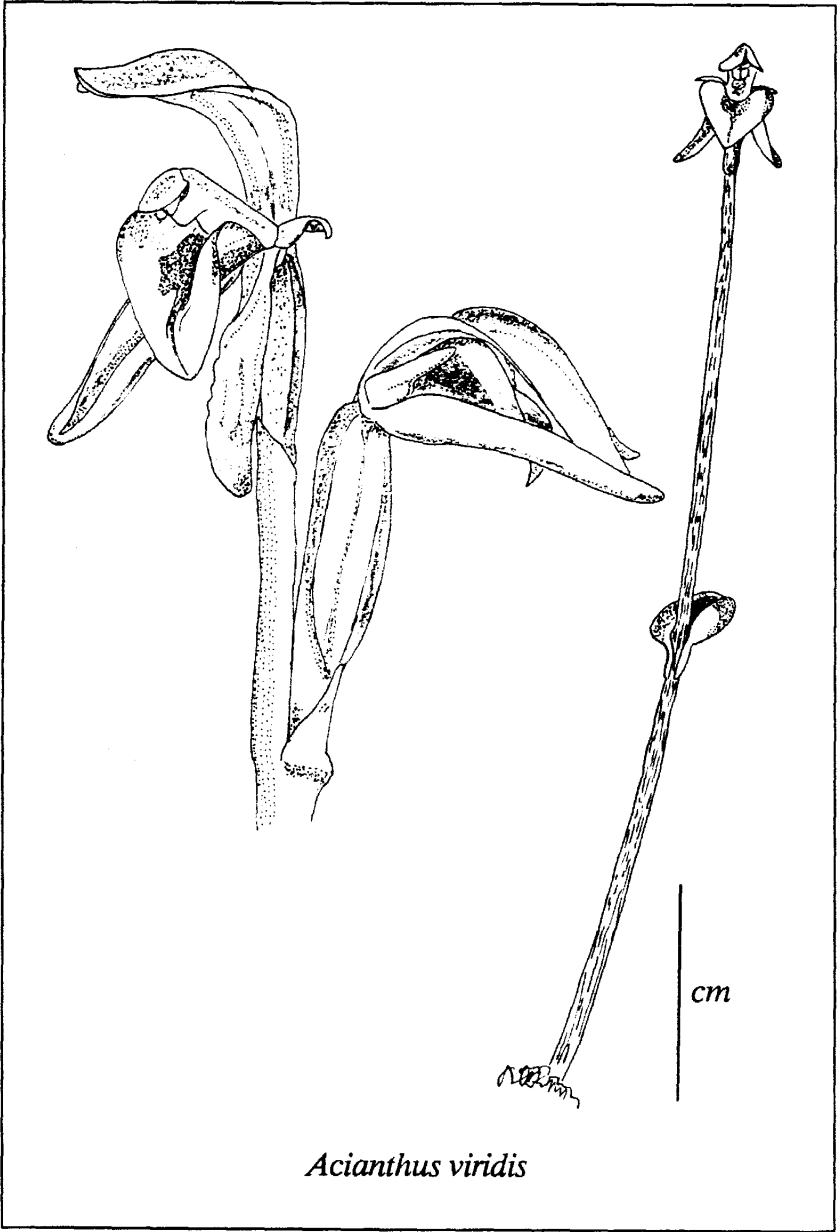
Occurrence: small local populations, common elsewhere in NZ; *A. sinclairii* is predominantly insect pollinated: the prominent bi-lobed rostellum separates the pollinia from the stigma and prevents self-pollination.

Cultivation: it is a reliable grower, which flowers readily and makes an excellent massed display in larger pots. Basic mix; 50% shade.

Historical note: J.D. Hooker noted in 1853 in his *Flora Novae Zelandiae*: "A small genus of Australian and Tasmanian very delicate herbs, found in many places in deep woods. The New Zealand species has been found also in Lord Auckland's group, and is very closely allied to the Australian *A. fornicatus*, but differs in the lip being less glandular."



Acianthus sinclairii



Acianthus viridis

Acianthus viridis J.D. Hooker

The "creeping forest orchid" is a slender, erect ground orchid of up to 10cm height, with an oval 1cm green leaf halfway up the stem, and another sometimes found at the base of the plant or at some distance from it.

The flowers are half a centimetre long, two to four on a stem, horizontal and greenish. The hood and lip are broad, the other sepals long and keeled, the petals short and upright.

The creeping forest orchid likes upland forest floors. It grows on the subantarctic islands and on Stewart Island, where it is not very common, and it has been collected from Fiordland; there is a specimen in the Otago University Botany Herbarium from Cascade Creek in the Eglinton Valley. I have seen it only in deep mossy beech forest in the Longwoods near Invercargill, where Gordon Watson and David McNaughton found it.

Occurrence: local small populations in our region; rare in the North Island, more common in the South, also Tasmania. It flowers here in early December, and is predominantly self-pollinating.

Cultivation: *A. viridis* has a creeping fleshy rhizome and its saprophytic nature prevents successful pot culture.

Historical note: William Townson wrote in 1906, "I had the good fortune to discover in the same situation (Mount Rochfort) a little orchis which forms a new genus, and which Mr Cheeseman has honoured me by naming *Townsonia*." T.F. Cheeseman thought this was not an *Acianthus*, and wrote in his *Manual of the New Zealand flora*: "A very curious little plant Believing it to be the type of a new genus, I have much pleasure in dedicating it to its discoverer, Mr. W. Townson, of Westport."

Adenochilus J.D. Hooker, 1853

Two species, the other in Australia. They are terrestrial orchids usually with a single flower; the dorsal sepal above, arched over the column; the lateral sepals and petals long and thin; the labellum semi-erect, bearing rows of calli; the column long and curved, with wings extending above the anther; mealy pollinia; a prominent stigma. Single leaf, on the flowering stem and/or arising at a distance from the rhizome which is branched and fleshy.

Adenochilus gracilis J.D. Hooker

Most New Zealand ground orchids have tubers that store energy in the form of starch. (Several of these were eaten by the Maori, some of the small pea-sized tubers being scratched up as snacks by children, others roasted). The "slender forest orchid" is unusual in having no such tuber.

The flower is graceful, with long pointed petals and sepals (the petals, in plants from Cascade Creek in Fiordland, often curling behind the flower almost to form a circle), the hood arched over and nearly hiding the column and lip. It is white or greenish, the lip bearing red blotches or bars, the petals sometimes similarly red spotted. Yellow calli lie along the pointed midlobe of the lip.

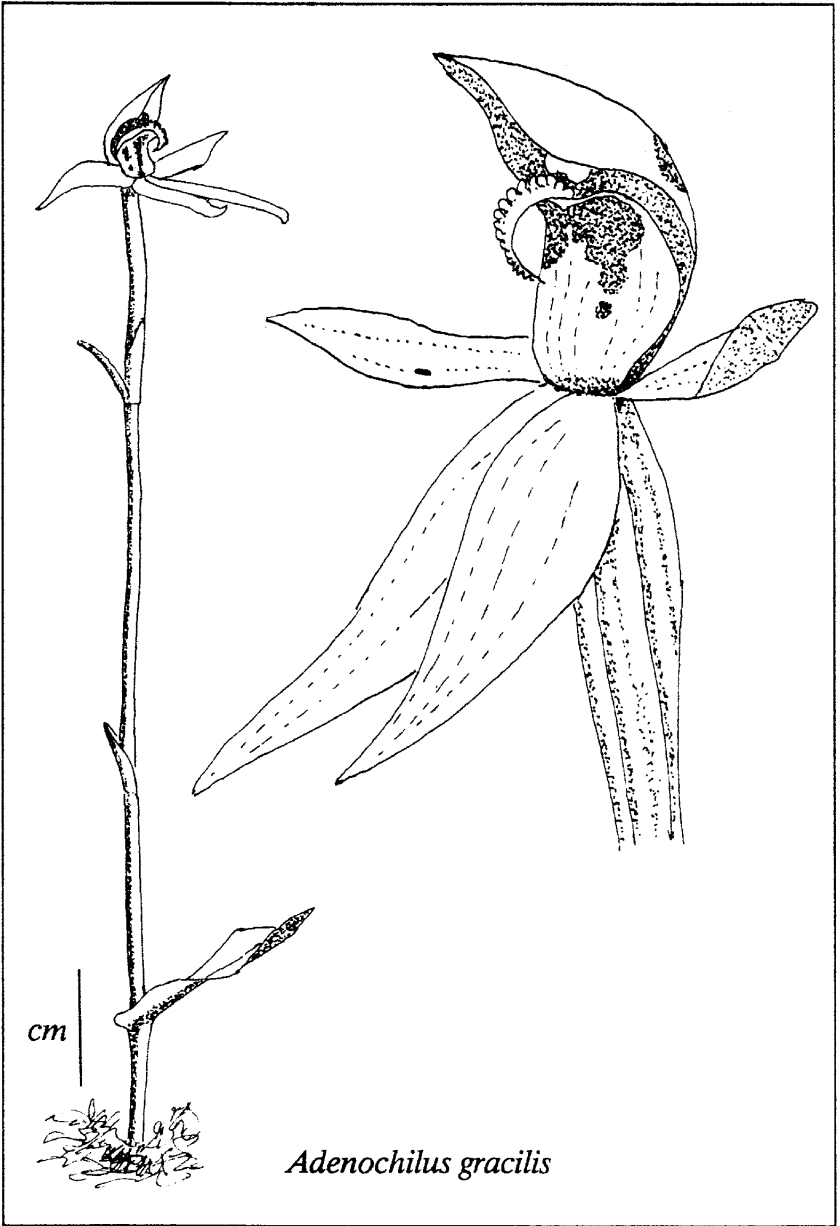
The flower is a centimetre or two in diameter, single, on a long thin stem with one rather broad, triangular leaf about halfway up the stem (other leaves may be found at some distance from the plant, connected by the horizontal rhizome).

An orchid of the beech forests, from the Forest Road near the Routeburn, and beside many southern bush tracks: Twelve Mile Creek near Queenstown, in the Caples Valley, Rainbow Reach and Dock Bay at Manapouri, Lake Gunn and the Marion track, and on Stewart Island. Waipori, Mahinerangi (under an old stand of *Pinus nigra*) and the Maungatua forest areas are the closest habitats to Dunedin I have seen.

Occurrence: common in the west of our region, it flowers in December and is predominantly self-pollinating.

Cultivation: saprophytic tendencies make this species difficult to grow artificially. It will survive in a pot but does not thrive or flower. Not recommended for cultivation.

Historical note: the Dunedin teacher G.M. Thomson wrote in the *Journal of Science* in 1882: "I found the plant this last January, when botanising in the neighbourhood of Lake Hauroro (Howloko), in the south-eastern corner of the South Island . . . Mr. Petrie informs me that he believes it occurs in the forest at the head of Lake Wakatipu, but he has only seen the leaf". Petrie was right.



This is an endemic New Zealand genus of one (perhaps two) species.

Aporostylis bifolia (J.D. Hooker) Rupp and Hatch

The "odd-leaved orchid" owes its common name to the difference in size of its two leaves.

It is a ground orchid, 15cm tall, hairy-stemmed with its two furry leaves horizontal and unequal; in dark beech forest they may be entirely green, up to 25cm long; in the open sun they are shorter and broader, blotched with brown. The flower is a couple of centimetres across, white, the hood broad and somewhat arched over the green-speckled column, the other sepals and petals narrower. The lip has yellow markings, and broadens from a narrow base; an isolated colony with a narrower, petal-like lip grows at one site in the Catlins.

For her book on New Zealand orchids, Dorothy Cooper chose the odd-leaved orchid as the cover picture; it has become the emblem of the New Zealand Native Orchid Group.

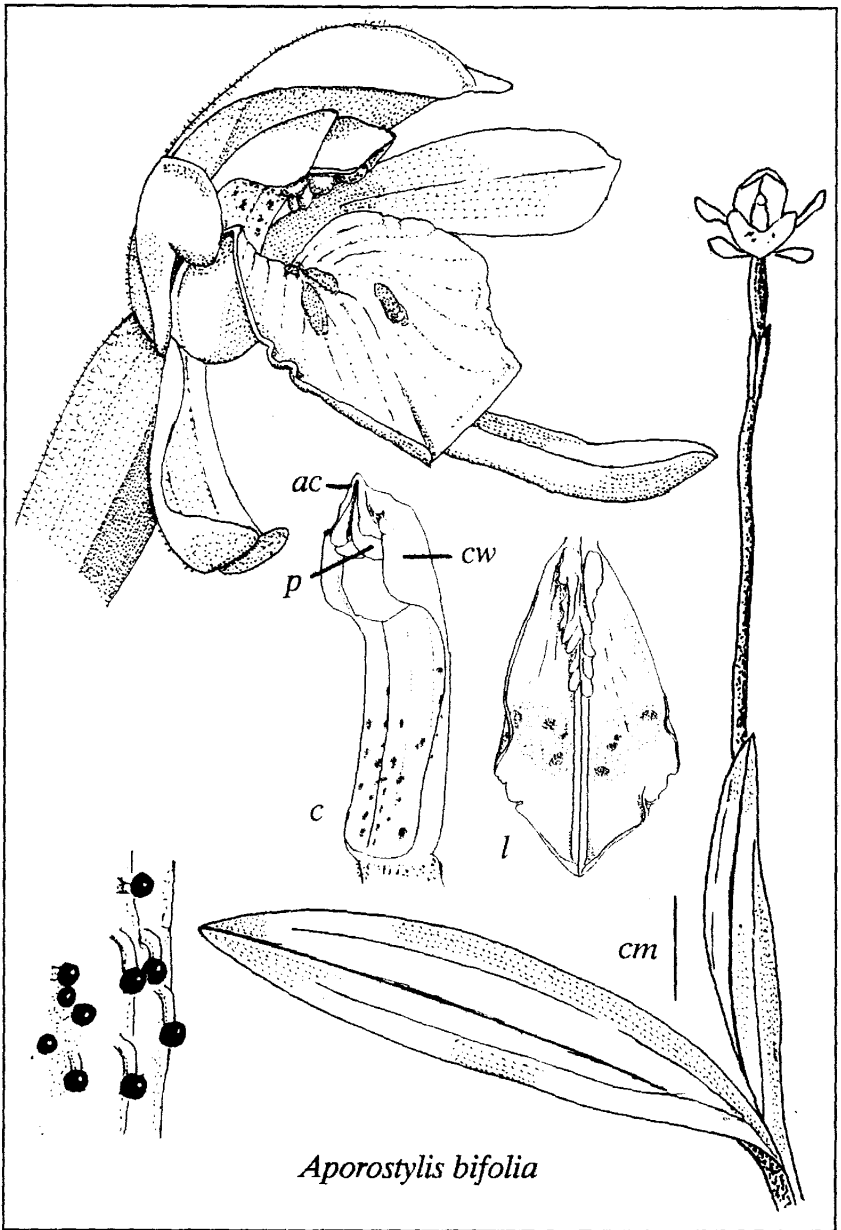
It is common on Swampy Summit near Dunedin, and on the dry tops of Silverpeaks country; abundant on Stewart Island and near the start of the Routeburn track, where the Caples track descends to Lake McKellar, under tussock in the Greenstone valley, at Lake Wilkie, Key Summit, Dock Bay at Manapouri, Blue Mountains, Dansey's Pass. I have seen it three metres up the mossy trunks of trees near Manapouri. It thus ranges from upland sphagnum bogs to damp shady mossy forest floors to dry tussock grassland.

There may be two species in New Zealand.

Occurrence: very common in our region, it flowers in January, and is predominantly insect pollinated.

Cultivation: it is difficult and not recommended for cultivation.

Historical note: William Colenso found it in the Ruahines, and called it *Caladenia macrophylla* in 1895. He wrote, "A plant that has caused me much trouble as to fixing its proper genus." Indeed, it has been included in *Caladenia* and in *Chiloglottis*, but was finally named *Aporostylis* by Rupp and Hatch in 1946.



Aporostylis bifolia

There are over one thousand *Bulbophyllums*, perching orchids, in America, Africa and Asia. New Zealand has two species; a northern one, *B. tuberculatum*, is listed as one of New Zealand's endangered plants. These are the only New Zealand orchids with a pseudobulb, the swollen leaf-base characteristic of many overseas and cultivated orchids.

Bulbophyllum pygmaeum (Smith) Lindley

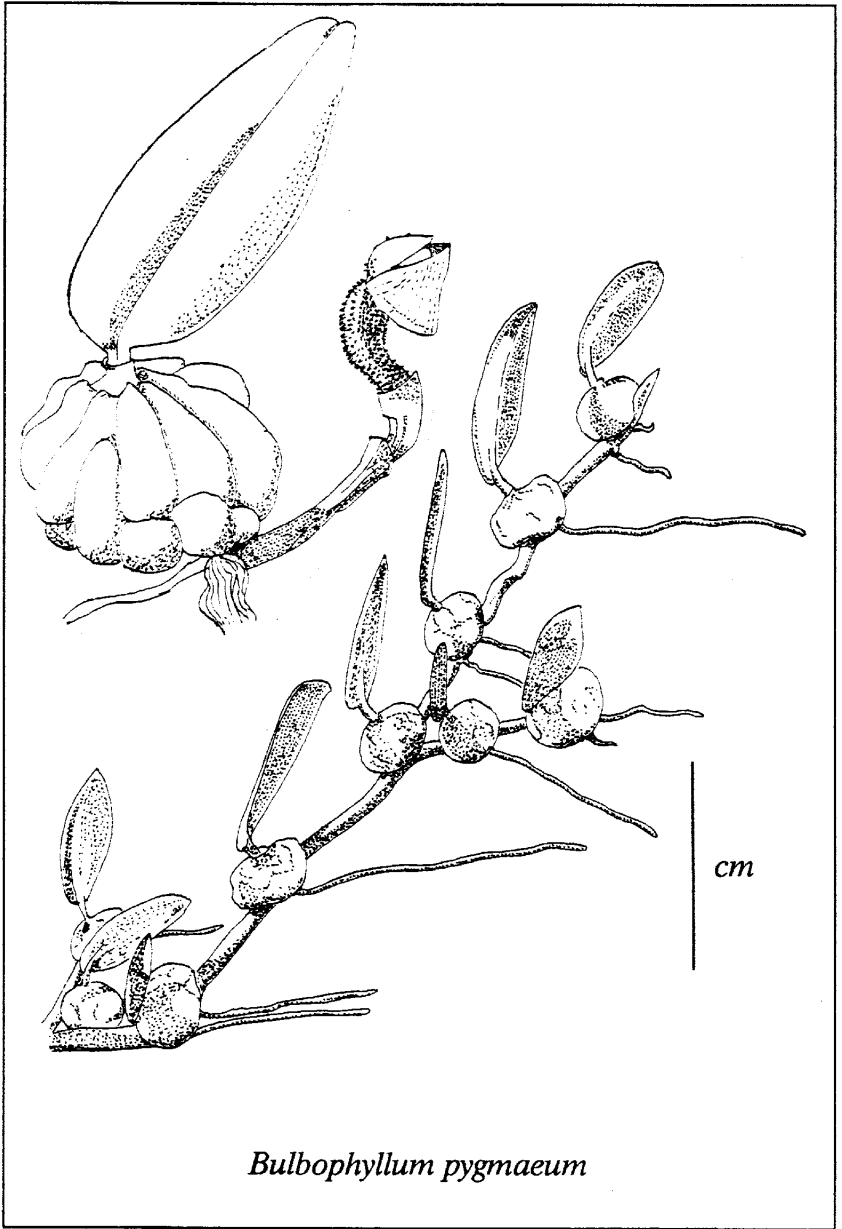
This "bulb-leaf orchid" is tiny, a series of match-head-sized green pseudobulbs each topped by a single, 1cm oval leaf, the whole plant forming a mat on high branches and canopies of trees (usually found when rimu or other podocarps fall), and on rocks. The flower is green, 3mm across: it seems to open only briefly.

It is found on treetops in Canterbury, but lower down in the north, and in our region I have seen it only at Martin's Bay on kowhai and on old introduced sycamores. Peter Johnson has records from South Westland and Fiordland (Cascade River mouth, Barn Bay, Martin's Bay and Northport in Chalky Inlet). It is reported also from West Cape, Dusky Sound and rarely on Stewart Island, but to my knowledge has never been found in the east of our region.

Occurrence: rare here, more common in the north. Self-pollinating; flowering is in the summer.

Cultivation: difficult to grow well by the slab culture method. The fine root systems require the slab to be kept moist at all times. It lends itself to pot culture. Using a medium grade bark (6-12mm) with coarser material in the bottom of the pot for good drainage, this species will thrive. Plants should be placed on top of the mix and firmly "pinned" down with staples. Regular watering keeps the surface of the mix damp, and once plants are established, the judicious application of dilute liquid fertiliser can be beneficial. Shade of 50-70% suits this species.

Historical note: this was one of the seven orchids found by Banks and Solander on Cook's first voyage, and illustrated by Sydney Parkinson. Solander called it *Epidendrum pygmaeum*. Sheila Natusch made the first discovery of the species on Stewart Island, reporting in 1968, "When I tramped across the Island to the rugged headlands in the north-west, I found, matted on a huge boulder, a creeping plant whose tiny green leaves sat on globular storage-tanks (pseudobulbs) the size of mikimik' berries, only green. This was a species of the orchid *Bulbophyllum*."



Bulbophyllum pygmaeum

Caladenia R. Brown, 1810

There are about a hundred *Caladenias*, most of them Australian. All of the seven New Zealand species (there are three in our region) also occur in Australia. They are hairy terrestrial orchids, with one or few flowers, the dorsal sepal forming a hood above and the petals and lateral sepals similar to each other; the labellum is semi-erect, sometimes three-lobed, its margins often toothed, bearing calli in longitudinal rows; the column is long and winged with a terminal anther; the four pollinia contain granular pollen; the tubers are globular; the single leaf hairy, long and thin.

Cultivation: basic mix with addition of a little more bark, 30-50% shade. Some N.Z. *Caladenias* can be difficult to grow and none multiply vegetatively. The seed of most species will germinate in the mulch on top of the pot. When capsules are ripe and begin to open, sprinkle the seed around the parent plant and water in. Together with the adult plant, anything from 3-15 seedlings have been seen to appear the following season.

Caladenia catenata (Smith) Druce

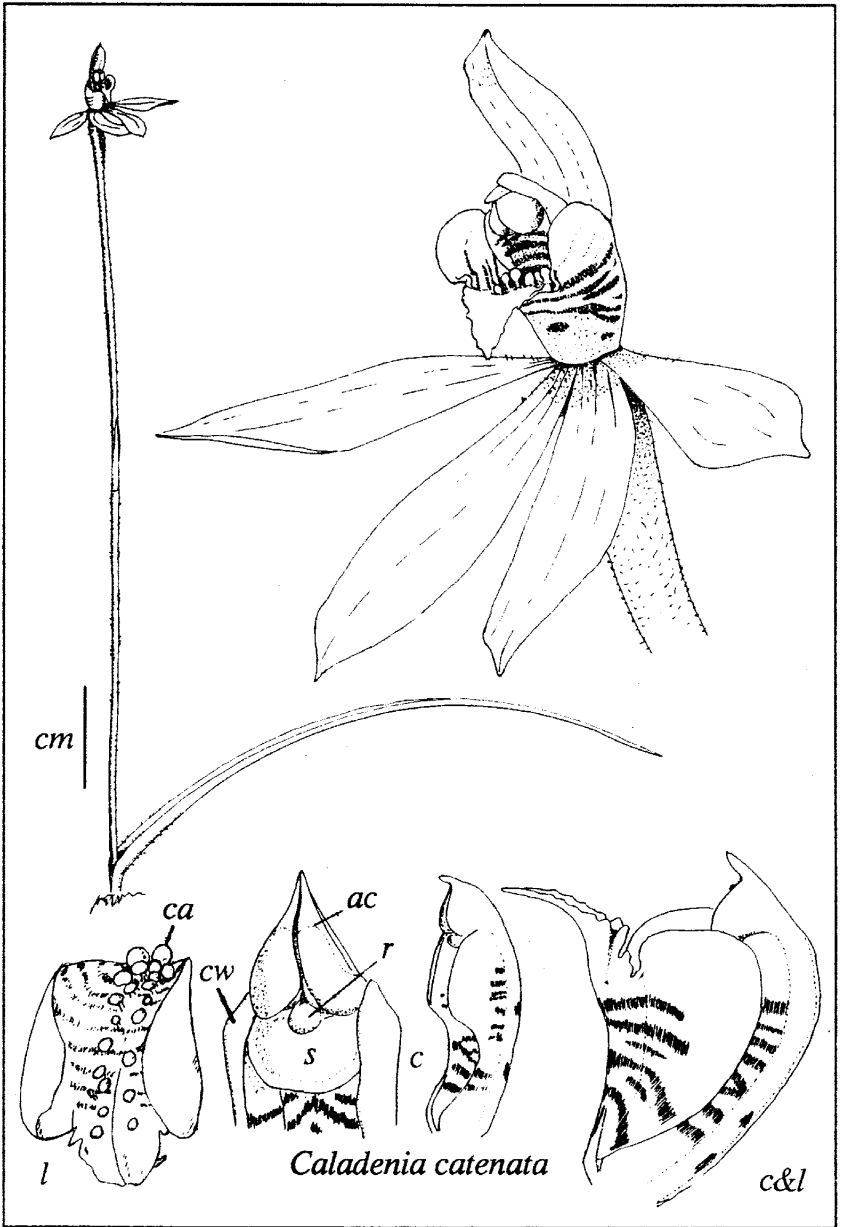
The usually lone flower is a centimetre in diameter on a slender, somewhat hairy, upright stem of perhaps 15cm. The single narrow leaf is about the same length but usually lies along the ground. The flower may be white or greenish, but is most often a rich pink. Under beech or scrub the plant appears as a bright pink gem among the drab leaf litter.

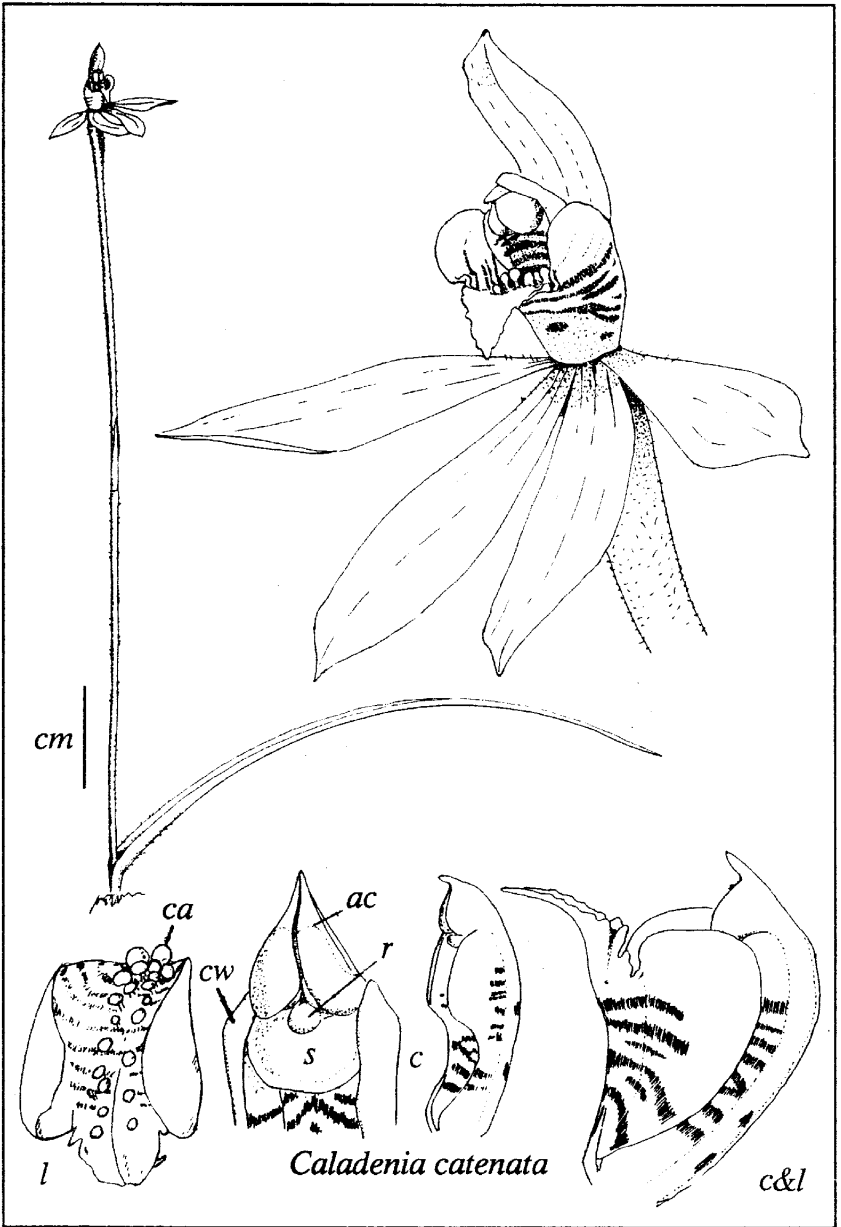
The lip of the "pink fingers orchid" is barred red and white and the yellow calli in two even rows do not extend onto the triangular midlobe; the tip of the midlobe is pale. The three sepals and the other two petals are long, narrow and more or less pointed, the petals more horizontal than those of *Caladenia* species (see below), the dorsal sepal closely covering the column.

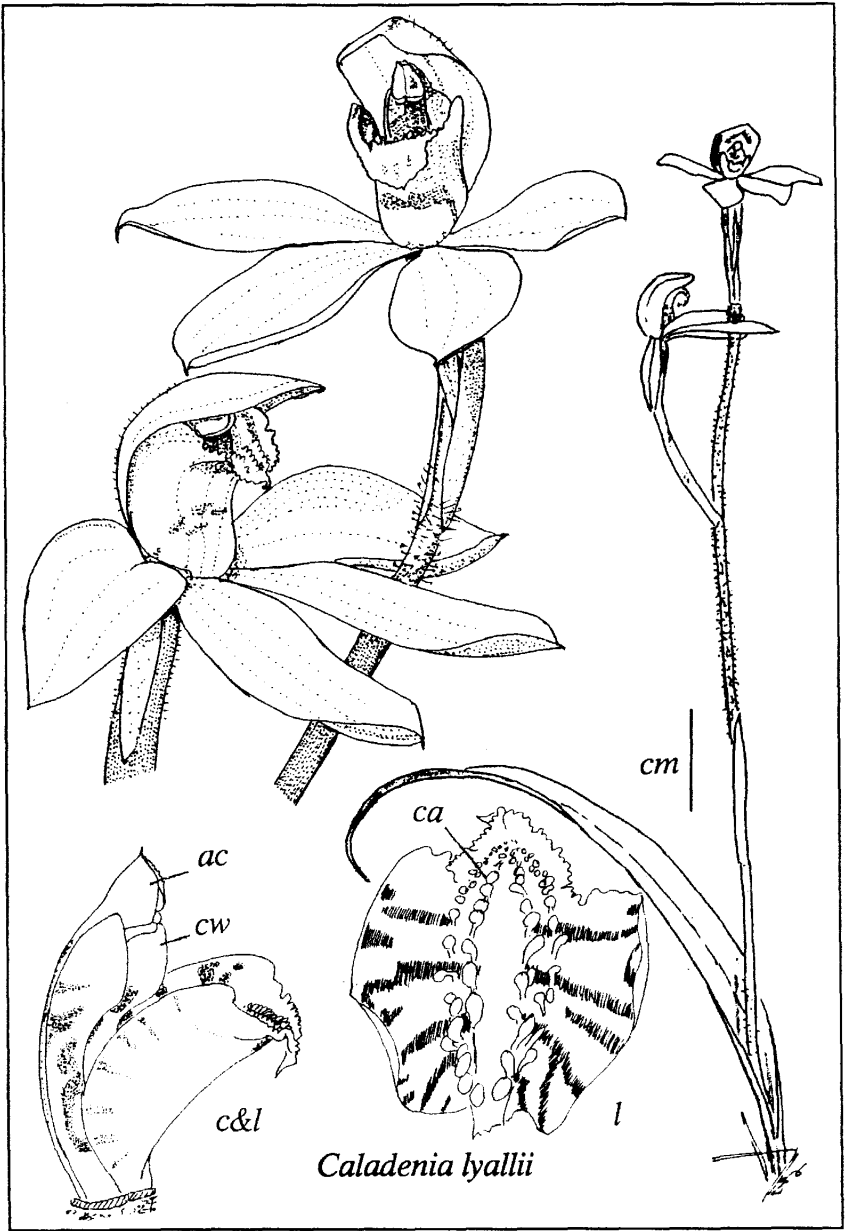
From Five Mile Creek near Queenstown, Shag Point in north Otago; fairly common on Stewart Island.

Occurrence: uncommon. It flowers here in November to January and is predominantly self-pollinating.

Historical note: Miss Helen Dalrymple rallied the schoolgirls on an outing to a part of Signal Hill in Dunedin (1937): "But the rarest little orchid on Stony Hill has so far evaded us. It is a very slender pink-flowered plant called *Caladenia minor*, and the girl who first finds it is to have threepence as a reward!" She was referring to *C. catenata*.







Caladenia lyallii J.D. Hooker

New Zealand's first collection of this species was from Otago, by Dr David Lyall, surgeon on the *Acheron*.

One to four flowers of 2-3cm diameter grow on a 5-20cm, hairy, upright stem, with a single, long leaf of up to 1cm wide, at the base. The flowers are white or pinkish, the petals and sepals wider than on the other New Zealand *Caladenias*, the hood often tinged brown-pink and arched over the column and lip. The lip may be striped red and white, and carries four regular rows of calli.

A larger flowered form has been reported from the Central Volcanic Plateau in the North Island, and I have seen a very large plant, with a 4cm diameter flower whose lip bore six rows of calli, on Swampy near Dunedin.

The "white fingers orchid" is reasonably common. The plant can be found under manuka and light scrub, to sea level in our region. It is easily located on the Blue Mountains, and on Flagstaff, Swampy Summit, Silverpeaks, Pigeon Flat roadside, Berwick Forest and on many of the hills around Dunedin; Supply Bay at Manapouri; uncommon on Stewart Island.

Occurrence: common. It flowers from November to January and is predominantly insect pollinated.

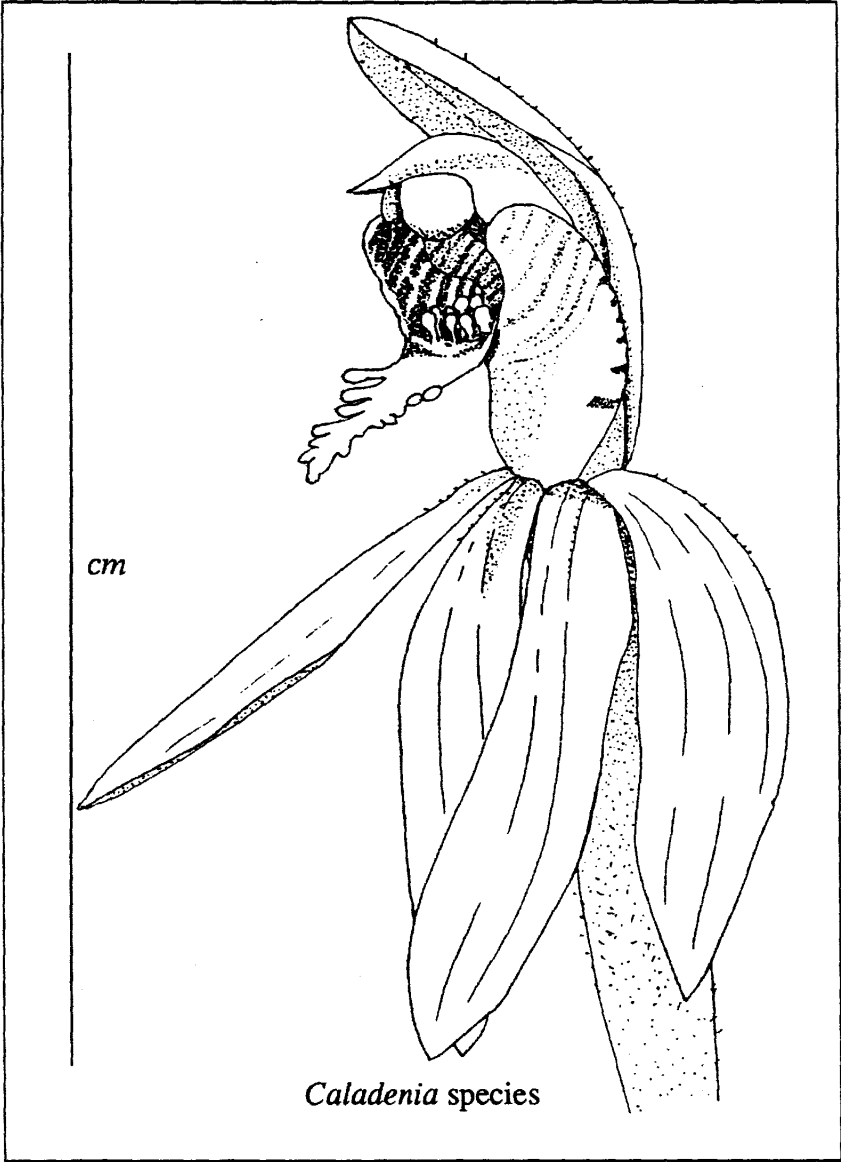
Cultivation as for *C. catenata*.

Historical note: secretary of the Dunedin Naturalists' Field Club B. Cracroft Aston minuted an excursion to Flagstaff on 7 November 1894, "On reaching the open at the top of the hill the rain had steadily set in & most of us decided to return. Before doing so we collected . . . *Caladenia Lyallii*." In the second edition of William Martin's *Native plants of Dunedin and its environs* is written: "*Caladenia lyallii* when in flower is an attractive orchid with a single, narrow leaf and a scape bearing either one or two white flowers sometimes suffused with pink."

Caladenia species

A small terrestrial plant of the beech forests in our region, 15-20cm tall, the hairy stem usually bearing one, though often two white flowers, the dorsal sepal forming a hood close to the lip. The labellum has a much longer midlobe than that of *C. catenata*, and bears two rows of calli; the lip and column lack the red bars of the latter species. The petals and lateral sepals point more or less downwards.

At Rainbow Reach and Supply Bay (Manapouri), and at Lake Wilkie in the Catlins. Similar to a northern species tagged "green column".



Cultivation is as for *C. catenata*.

Occurrence: local populations in our region, it flowers in December, and is predominantly self-pollinating.

Historical note: the *Caladenias* have always been a taxonomic problem, with new and old names constantly replacing one another. J.D. Hooker described this as *Caladenia carnea* var. *alba*: "The Royal Gardens are indebted to Mr. J. O'Brien, of Harrow-on-the-Hill, for tubers of the white-flowered variety here figured, which flowered in a stove in February of the present year" (1898).

Chiloglottis R. Brown, 1810

Of nine Australian species of *Chiloglottis*, one occurs in our area; a second, *C. formicifera*, was recorded from Northland, but is now regarded as extinct; and a third, *C. valida*, is a recent discovery in Canterbury and Iwitihi, east of Taupo. They are terrestrials, with usually single hairless flowers, the hood uppermost, the sepals and petals narrow, the winged column more or less erect, the labellum attached by a short column-foot. Two leaves, ovoid tubers.

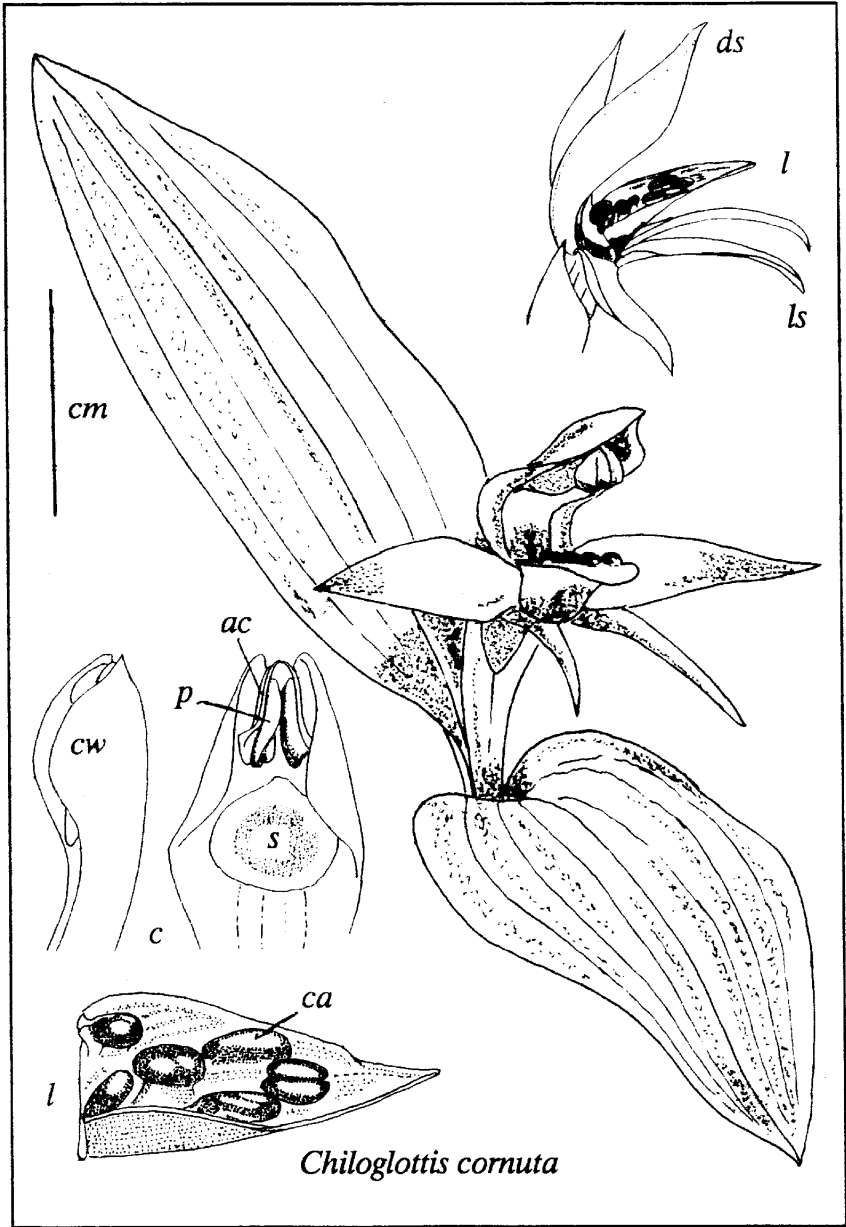
Chiloglottis cornuta J.D. Hooker

The "green bird orchid" is common by any forest track, its two equal, oval, veined, pointed, smooth 3-10cm green leaves lying close to the ground.

The green flower is a centimetre or two across. The hood is oval, narrowing to its base, overtopping the column. The sepals and petals are narrow and pointed, the former curling down below the labellum, the latter more or less horizontal. The labellum is decorated with prominent green or brown calli. The stem elongates greatly in fruit.

C. cornuta has adapted itself to our new forests; it grows happily in the mix of needles and bark beneath exotic pines (in many of the plantations around Dunedin), and may be spread in the pine chips used in garden mulch. Certainly it is thriving on such in the Dunedin Botanical Gardens.

Occurrence: very common. Flowering is from November to February, and it is predominantly self-pollinating.



Cultivation: basic mix with some of the soil replaced with more sand. Shade 50%. *C. cornuta* is not easy to grow well as tubers tend to rot, but as it is common some experimentation with mixes and techniques could be attempted by growers.

Historical note: G.M. Thomson of Dunedin wrote in 1878, "The arrangement of the parts is so simple that an insect alighting on the labellum and advancing its head into the base could hardly fail to remove the pollinia; nor could one entering with pollen on its head fail to leave them on the stigma I am inclined to think self-fertilization takes place in flowers which have not been visited by insects I examined one sunny day twenty-two flowers growing in the open; of these only three had both pollinia removed . . ."

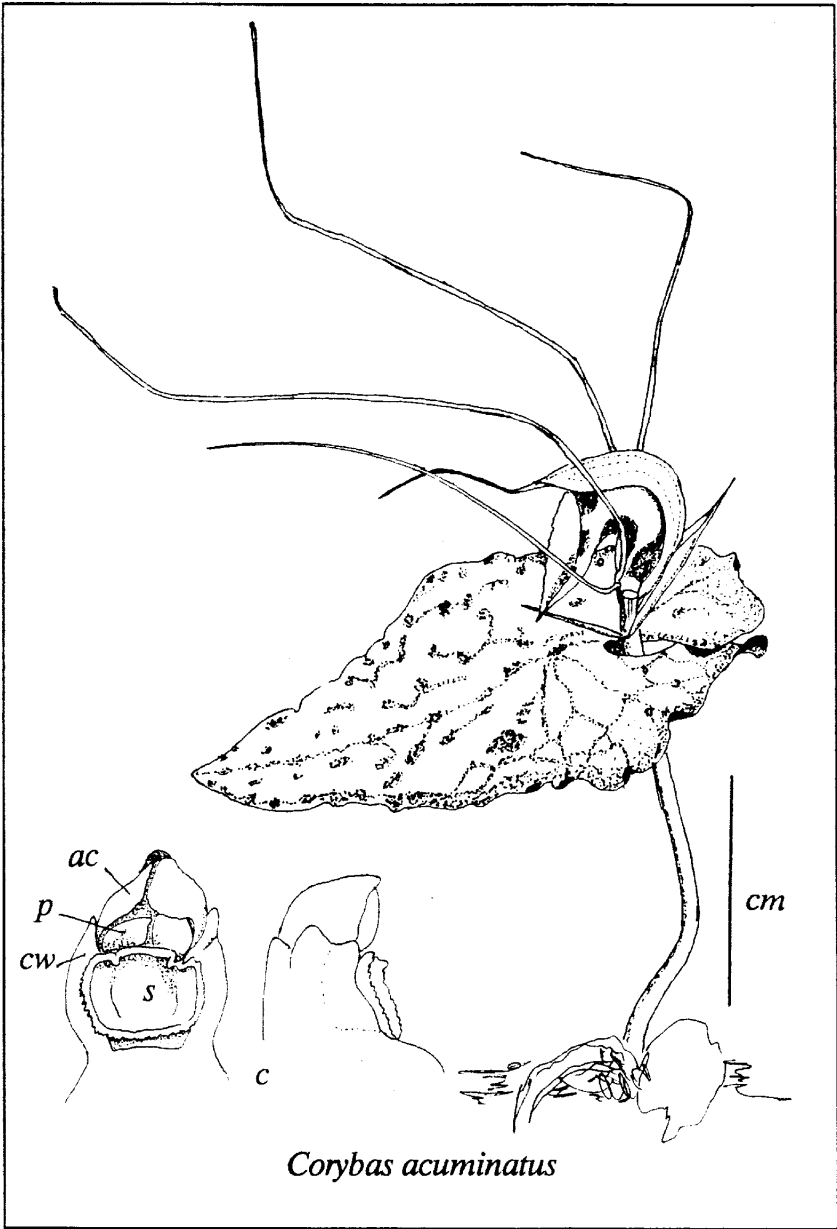
Corybas Salisbury, 1807

There are perhaps a hundred *Corybas* species from southeast Asia to New Zealand. None of the New Zealand species are now thought to be shared with Australia, though several of the northern "helmet orchids" (those lacking the elongated sepals and petals of our "spider orchids") are closely related to Australian species.

All are terrestrials, with solitary flowers; the dorsal sepal is uppermost, and is close to the tubular labellum; the column is short, leans backwards, with a discoid stigma. The petals and sepals of the seven southern species are long and thin, giving the plants a spider-like appearance. The tubers are spherical.

The single leaf is flat, broad and more or less round, sometimes silver-backed. The stem elongates greatly in seed. Of our seven, three usually do not have leaf stalks (*C. acuminatus*, *C. oblongus*, and *C. rivularis*), three usually do (*C. macranthus*, *C. trilobus* and *C. "short tepals"*), and one is leafless (*C. cryptanthus*).

Cultivation: basic mix with more leafmould added. *Corybas* grow in damp, shady, sheltered places. They prefer shade of 50-70% and pots that are kept damp throughout the growing period. Most species can be grown readily, doing better when grouped in pots. Keep these in the cooler, darker area of the shadehouse. *C. oblongus* has proved difficult in cultivation. *C. cryptanthus* is saprophytic which excludes it from pot culture.



Corybas acuminatus

Corybas acuminatus Clements and Hatch

C. acuminatus has a thin triangular leaf with a rippled edge; the flower is almost transparent, its hood extended to make a fifth "leg" for the spider.

Janette West found it in wet mossy forest near the Divide on the Milford road. Also in the Longwoods, Stewart Island, Manapouri, and near the mouth of the Hokuri River where it flows into Lake McKerrow, forming colonies of many plants. I have never seen it in the east of our region.

Occurrence: uncommon in the south. It flowers from October to December, and is predominantly insect pollinated.

Historical note: this was until recently confused with and misnamed *C. rivularis*. Mark Clements recognised the error, and he and Dan Hatch formally described this species as *C. acuminatus* in 1985. Mention of "*C. rivularis*" between 1906 (Cheeseman) and 1985 mostly refers to *C. acuminatus*.

Corybas cryptanthus Hatch

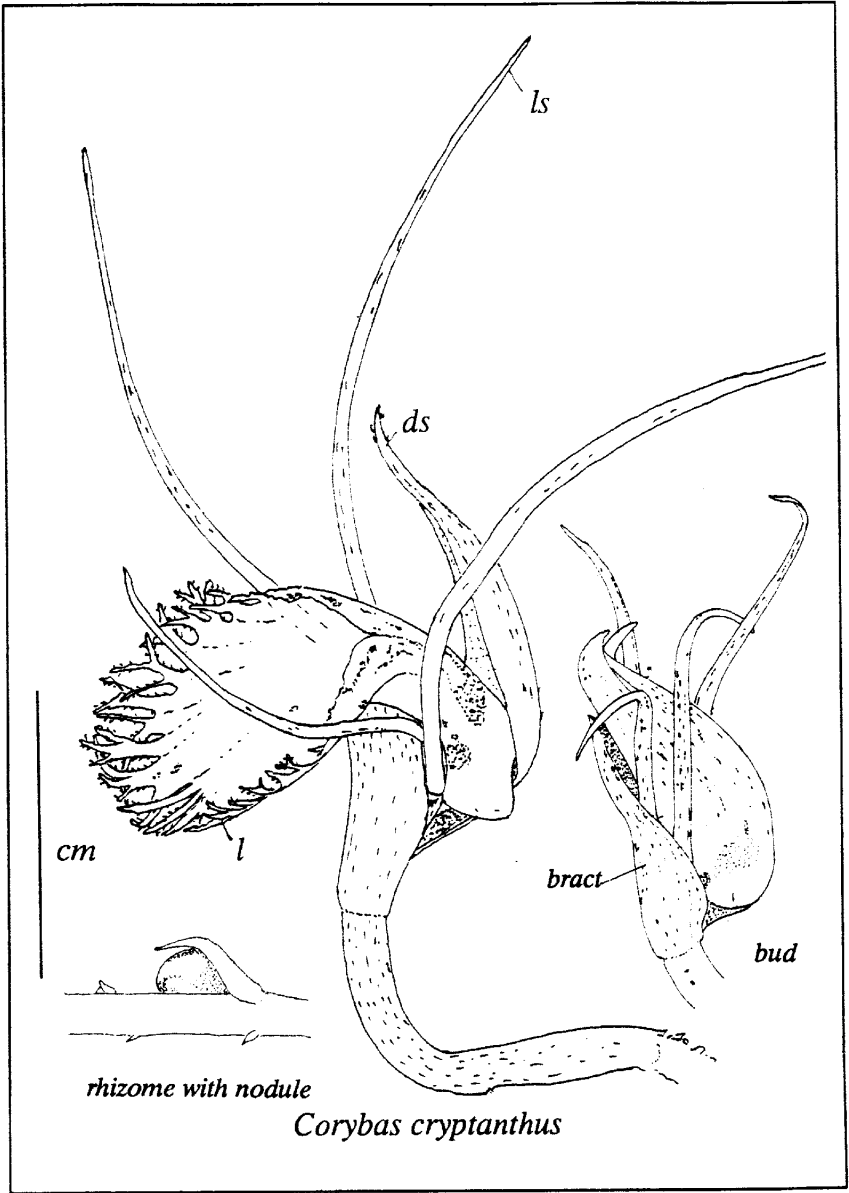
C. cryptanthus was recorded from Manapouri by Colin Burrows and Andrew Dobson when the lake was threatened, in the course of a search near the hut at Shallow Bay.

This is a curious, leafless orchid, entirely lacking chlorophyll, usually growing with mosses, almost entirely beneath the litter of the forest floor. The flower is nearly colourless, but may be flecked with red and brown, the lip wide and fringed, the hood as long as the lip, the sepals and petals long and often emerging above the surface of the leaf-litter. The bud emerges from a vestigial leaf bract. There is a long, horizontal, branching, threadlike 1mm diameter rhizome, with tuberous nodules and tiny bracts along its length. As with all *Corybas*, its stems elongate (up to 15cm) in seed, and I am told that November, when leafless seeding stems can be found above ground level, is the best time for locating it.

I can find no other reference to its having been seen south of Reefton and North Canterbury, but that may be because nobody has really looked.

Occurrence: rare here: flowers in September in Canterbury: self-pollinating.

Historical note: Colenso had written (1884) "while its one small leaf is spread flat on its mossy bed, its delicate flower is 1-2 inches below the surface, and never appears above during its flowering." He may have been describing a mixed colony of *Corybas trilobus* and *C. cryptanthus*: they sometimes grow together, though the type material is certainly *C. trilobus*.



Corybas macranthus (J.D. Hooker) H.G. Reichenbach

C. macranthus is the largest *Corybas*, liking better-lit sites, often under scrub, forming large colonies of many plants.

The stalked green leaf is thick and fleshy, silver-backed, often bearing brownish markings along the edge; the petals are shorter than the sepals (both much elongated), the lip dark reddish black, the whole flower 1.5cm across.

At Trotter's Gorge, the Twelve Mile Creek near Queenstown (where the dorsal sepals are much longer than on any other specimens I have seen), Caples, Tautuku and Hinahina, Shag Point, Longwoods, Te Anau, Stewart Island (Hugh Wilson).

Occurrence: common. Flowers from October to December, predominantly insect pollinated.

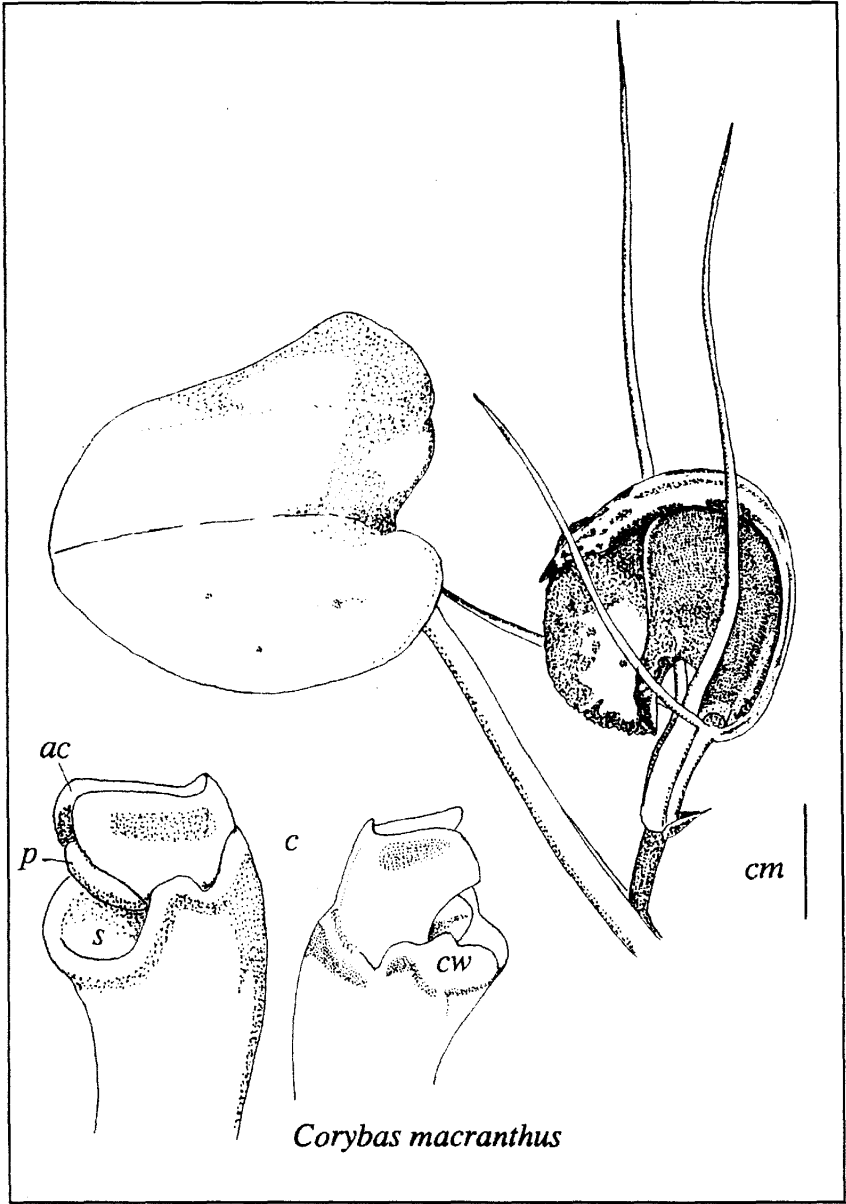
Historical note: G.M. Thomson wrote in 1878, "I could not understand why spiders frequented these flowers so much, but I soon found a sufficient cause. The only insects capable of removing pollen which were found about the flowers were small Diptera -- probably a species of *Culex*. In several cases these small flies had penetrated into the tube of the flower, and, in their eagerness after the sweet juices found there, brought their heads into contact with both rostellum and stigma, and partly owing to the viscosity of these parts, and partly to the narrowness and bending of the tube, were unable to withdraw backwards. In some flowers insects were thus found still alive, in others they were dead, while in many others only portions of them, such as legs, wings, etc., were left, the spiders having devoured the rest."

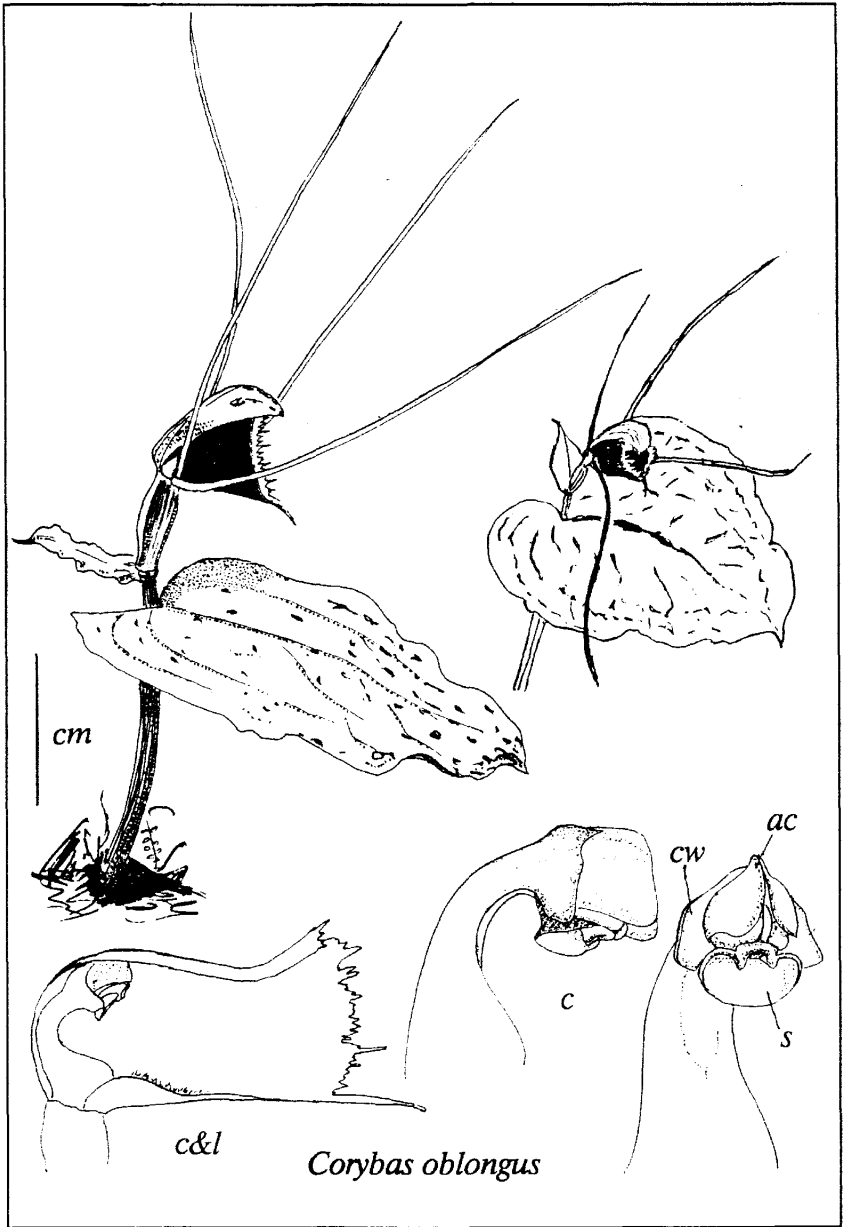
Corybas oblongus (J.D. Hooker) H.G. Reichenbach

C. oblongus has a thin, oval, brown-veined stalkless leaf and a tiny 5mm diameter tubular flower fringed with coarse teeth. I have seen it by the Tautuku nature walk, at Lake Wilkie in the Catlins, and on Stewart Island.

Occurrence: uncommon in our region, it flowers from October to November, and is predominantly self-pollinating.

Historical note: J.D. Hooker called the New Zealand spider orchids *Nematoceras*, but recognised later that they were similar to the Australian *Corysanthes*. Both were eventually included in *Corybas*. Of *Nematoceras oblonga* he wrote, "Lip 1/5 inch, broadly reniform, cordate when spread out, deep blood-red purple, with transparent edges, margin in front sharply toothed . . ."





Corybas oblongus

Corybas rivularis (A. Cunningham) H.G. Reichenbach

This is the species for long known as *C. orbiculatus*. It is closest to *C. macranthus* but the leaf has no stalk and it is harder to find, with long petals equal to the sepals. The leaf emerges from the ground in spring as a tight cone, which flattens to reveal the immature flower, its petals and sepals curled above the other parts. As the flower matures, the leaf flattens and the sepals and petals straighten.

It likes wet areas, and can often be found in running water. At Berwick Forest, Trotter's Gorge, Leith Valley, Stewart Island (Hugh Wilson). The easiest to grow.

Occurrence: fairly common. Flowers September to November, predominantly insect pollinated.

Historical note: G.M. Thomson noted in his diary (in the Hocken Library) in 1879, "*Corysanthes*: the species found on stones in Nicholl's creek -- now fast disappearing -- may be either *C. rivularis* or *C. macrantha*. Like so many other plants they probably run into one another". This was *Corybas rivularis* (it has not yet disappeared from the Leith Valley), and his difficulty in separating it from *C. macranthus* indicates that he understood the similarity, and was not confused with what we now know as *C. acuminatus*.

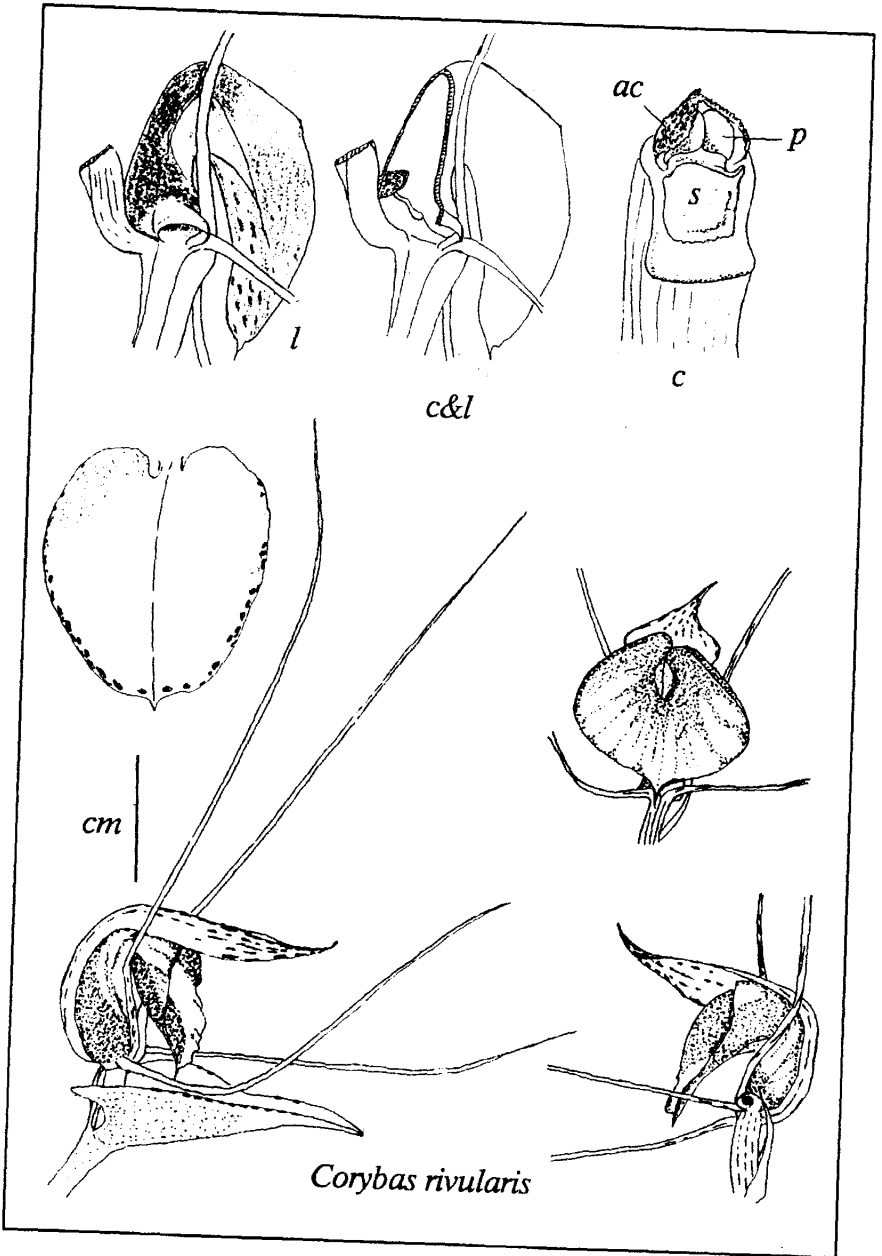
Corybas trilobus (J.D. Hooker) H.G. Reichenbach

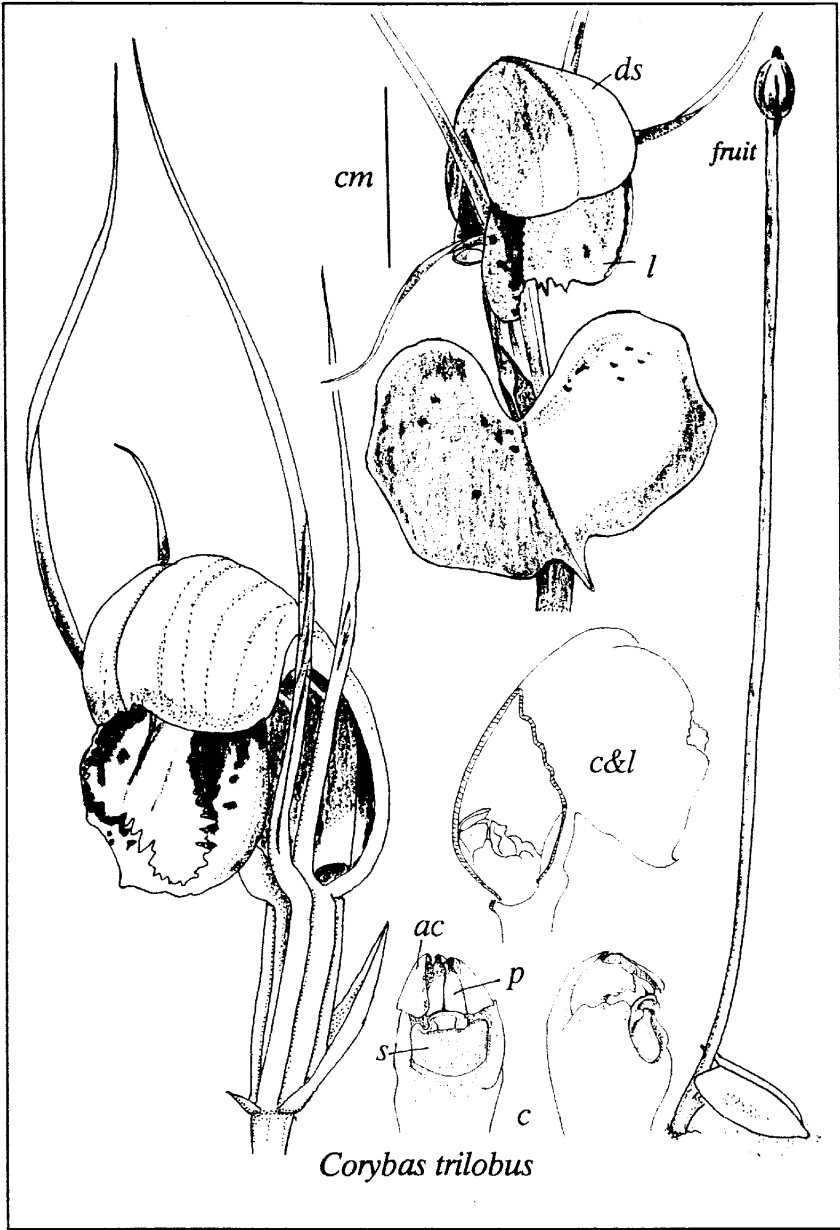
C. trilobus is the most easily found. Its round three-lobed leaves form carpets in much of the bush, the tiny red-and-green solitary flowers sitting spiderlike above or below the leaf. The hood is rounded.

There may be more than one species in what we know as *C. trilobus*. Beech forest plants begin to flower in July, their red-green flowers always above the leaf (near Queenstown the ground is still stiff with frost when they emerge). By contrast, plants at Trotter's Gorge and Martin's Bay are larger, have dark red flowers, always below the leaf, and in October. There appear to be some differences in the column and labellum.

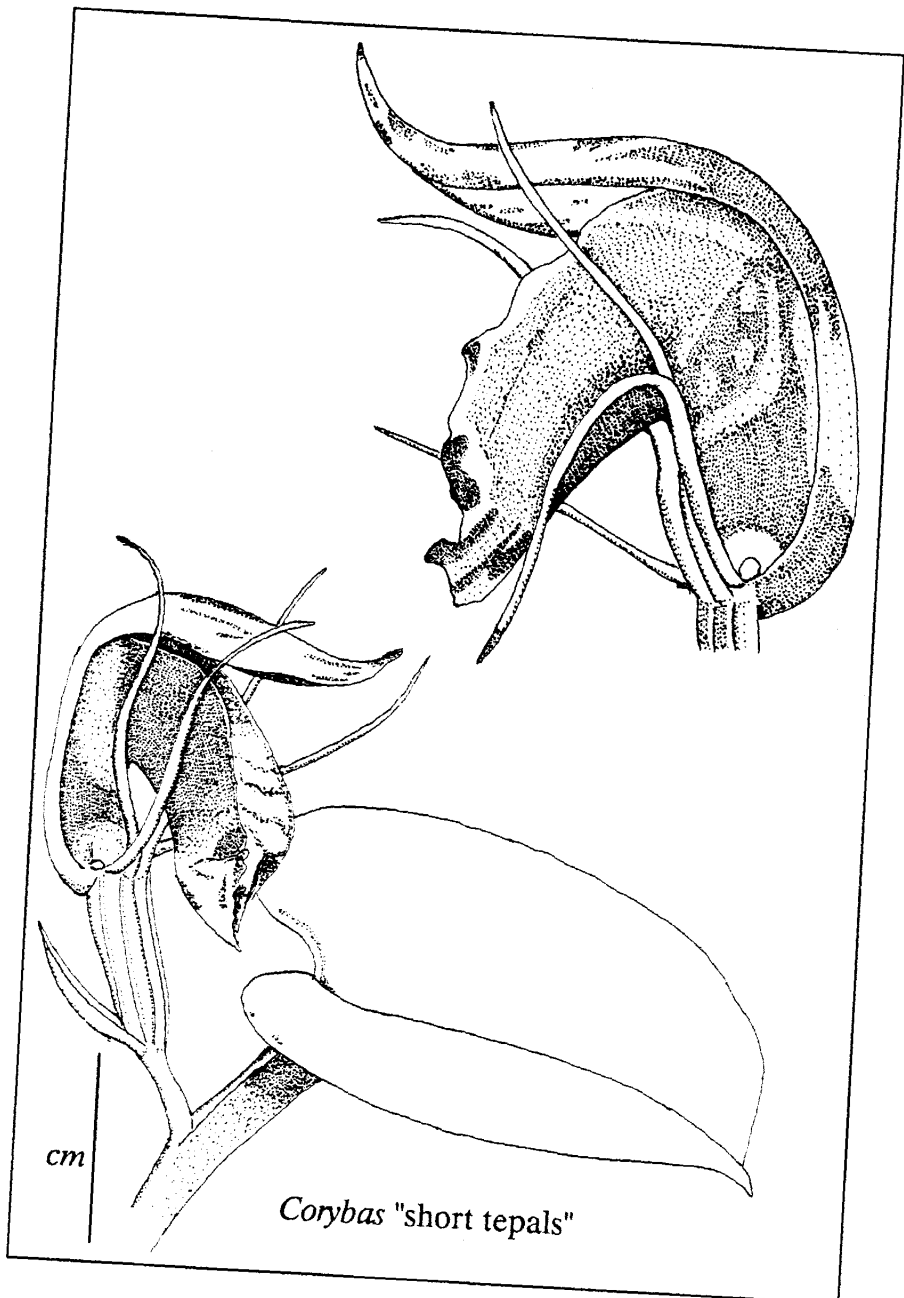
Occurrence: common in most areas of bush on the South and Stewart Island. Flowers July to December, then spreads vegetatively, so that large patches of leaves may show few flowers. Predominantly insect pollinated.

Historical note: "Come with us in imagination," Helen Dalrymple (1937) invited us, "on an excursion up Stony Hill on a shiny summer morning It is not long before we find our first spider orchids at the foot of some low manuka scrub lovely dark ruby red flowers, one flower to a leaf,





Corybas trilobus



Corybas "short tepals"

with rounded hoods, and long spider-like feelers Shrieks of delight from other groups are heard as they discover fresh patches..."

Corybas "short tepals"

For a number of summers I saw leaves of what I took to be *C. rivularis* growing in the moss in a thin waterfall up Butcher's Creek in the Skippers Creek tributary of the Shotover. Then one Labour weekend I saw the flowers, and it was *C. "short tepals"*, recognisable from Bruce Irwin's drawings, a new species for Otago, and one yet to be formally described.

The flower is purple, similar to that of *C. rivularis*, with the exception that the sepals and petals are very much shorter. I found several more colonies, always in moss in running water, sometimes protected from the force of the stream by overhanging grasses.

Occurrence: rare and local, flowering in October, predominantly insect pollinated.

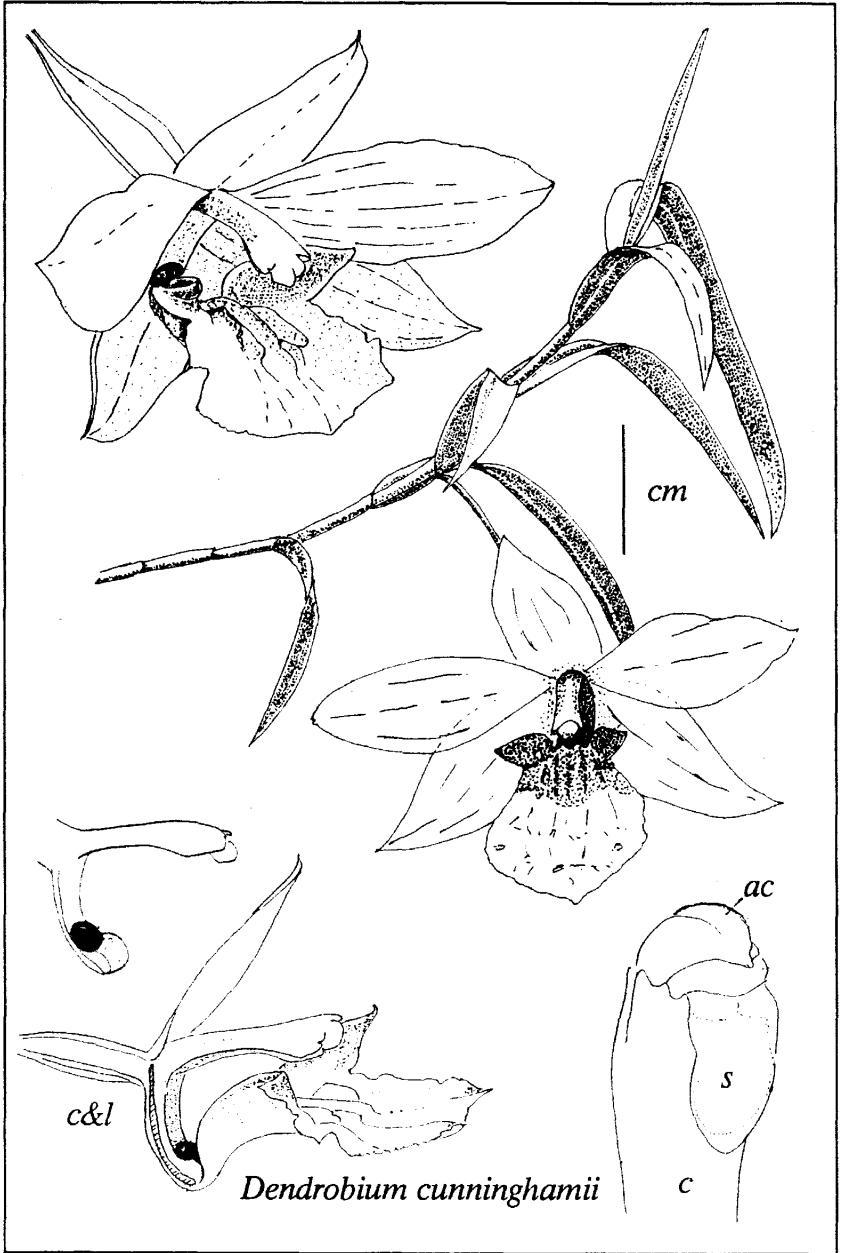
Historical note: recent history indeed. Bruce Irwin (now of Tauranga) recalled first seeing this plant in about 1950 near Wanganui: the New Zealand Native Orchid Group's *Newsletter* published his drawing in 1988. In 1989 he again reported finding what he called "*Corybas C*" in Taranaki. It has also been reported by Jean Jenks from near Nelson.

Dendrobium Swartz, 1799

From southern Asia to the Pacific there are over a thousand *Dendrobiums*, often with large showy flowers. They are perching orchids, growing on trees or rocks. New Zealand has one.

Dendrobium cunninghamii Lindley

This has the most beautiful of our orchid flowers. *D. cunninghamii* has been called Lady's slipper (because of the flower bud shape), but also the Tree Orchid, Cunningham's *Dendrobium* and Winika.



Dendrobium cunninghamii

The orchid's 3cm flower has white to green petals and sepals with a three-lobed lip attached to the column by a column-foot, which secretes a droplet of nectar. The lateral lobes of the lip are usually pink or purple, though an entirely white form is sometimes found. The stems are long, branching, yellow canes, the fine stems wiry and brittle, the leaves pointed, 3cm long by 3mm wide.

In a good summer there may be hundreds of flowers, on clumps of up to two metres diameter. It grows throughout New Zealand, most abundantly in wet lowland forests, sometimes on tree trunks, or as clumps the size of small shrubs on horizontal upper tree limbs. It finds the same sort of well-lit habitats on rock outcrops or cliffs, or hard-rock shores of lakes such as Manapouri and Te Anau, growing with low shrubs outside the forest edge. At Stewart Island it drapes the coastal banks in sheltered bay heads, growing on forest-edge lobes of well-drained peaty soil. Longwoods, Taieri River Gorge (large plants growing on the cliffs), Mihiwaka, Catlins.

Occurrence: fairly common, but overgathered near population centres. *D. cunninghamii* flowers from September through January and is predominantly insect pollinated.

Cultivation: it lends itself to both slab and pot culture. Use of a medium-coarse bark mix with coarser material in the bottoms of pots ensures good results. *Dendrobium* enjoys higher light levels so shade of about 25% is adequate. Watering and fertiliser as for *Bulbophyllum*.

Historical note: the name "Winika" was given in 1838 to a war canoe because this orchid was growing on the totara that was felled for the hull. "Te Winika" was smashed by von Tempsky, later reconstructed for ceremonials on the Waikato River, and now rests in the museum at Hamilton.

Drymoanthus Nicholls, 1943

This genus of four species was distinguished from the similar Australian *Sarcochilus* in 1943.

They are small perching orchids, their flowers in branching racemes, sometimes showing the lip uppermost, the petals and sepals similarly shaped, the labellum fleshy and cup-shaped, joined to a short column-foot; the column short and cylindrical; four pollinia in two pairs, attached by a stipe to the disc of a prominent rostellum; the stigma deeply concave. The elongated

seed capsules ripen slowly, and are full of hairs as well as the seeds; empty seed capsules may remain to the following season.

They resemble in miniature the elongated capsules of vanilla, also an orchid, originally from South America but now widely cultivated throughout the tropics. The rhizomes spread widely along branches and trunks of host trees. The leaves are arranged in two rows on either side of the stem, and although they arise alternately, they appear opposite each other on the abbreviated stem.

Cultivation: *Drymoanthus* often produces better results when grown in a pot than on a slab. As the roots are very long (up to a metre), a large pot (150mm) is essential. A medium-coarse bark (10-20mm) should be used and plants placed on top of the mix with roots buried. Fifty percent shade, and regular wetting of the surface of the mix. Occasional light fertiliser but very dilute.

Drymoanthus adversus (J.D. Hooker) Dockrill

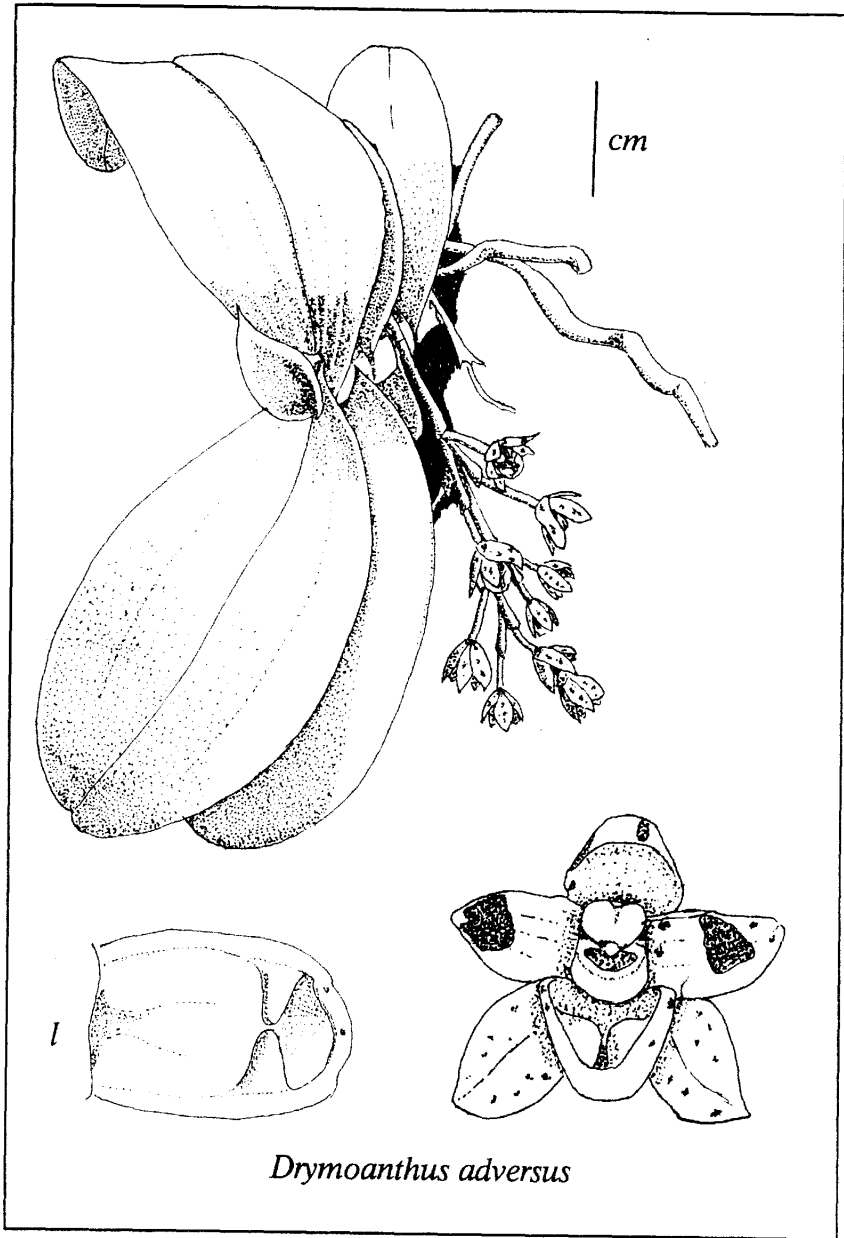
The "green fleshy orchid" is quite easily found in the north, and even in Canterbury is common enough.

It is an epiphyte, growing on the trunks of trees (over fifty host trees in the Waikato) and rocks. It has always been rare here, though is less so in Fiordland: I have seen it on several host trees at Martin's Bay, but nowhere else. Peter Johnson records it from Sutherland Sound (epiphytic on shrubs of *Olearia oporina* in salt marsh), Breaksea Sound, Gilbert Island and nearby Entry Island (on high limbs of mountain beech in lowland forest), and Big River, South Fiordland coast. There is a Lincoln herbarium specimen from Tahakopa.

One or two racemes bear 4mm flowers which are usually deeply flecked with purple, and the labellum has thickenings at each side within its cup, often joining to form a transverse bar. The leaves are shiny and thick, oval to oblong, pointed. The capsules appear large for the size of the plant.

Occurrence: uncommon in our region. Flowering in October at Martin's Bay. It is predominantly insect pollinated.

Historical note: Banks and Solander had collected "*Epidendrum adversum*" from Oporangi in 1769. J.D. Hooker described it in his *Flora novae-zelandiae* "A small genus of New Holland and Malayan epiphytical plants, of which one species inhabits New Zealand." We now know there are two New Zealand species.



Drymoanthus adversus

Drymoanthus "spotted leaf"

We first found this undescribed species on miro on Stewart Island, the plant a 5cm rosette, with stiff, dull, green, speckled, oval, pointed leaves, the roots spreading widely on the smooth bark.

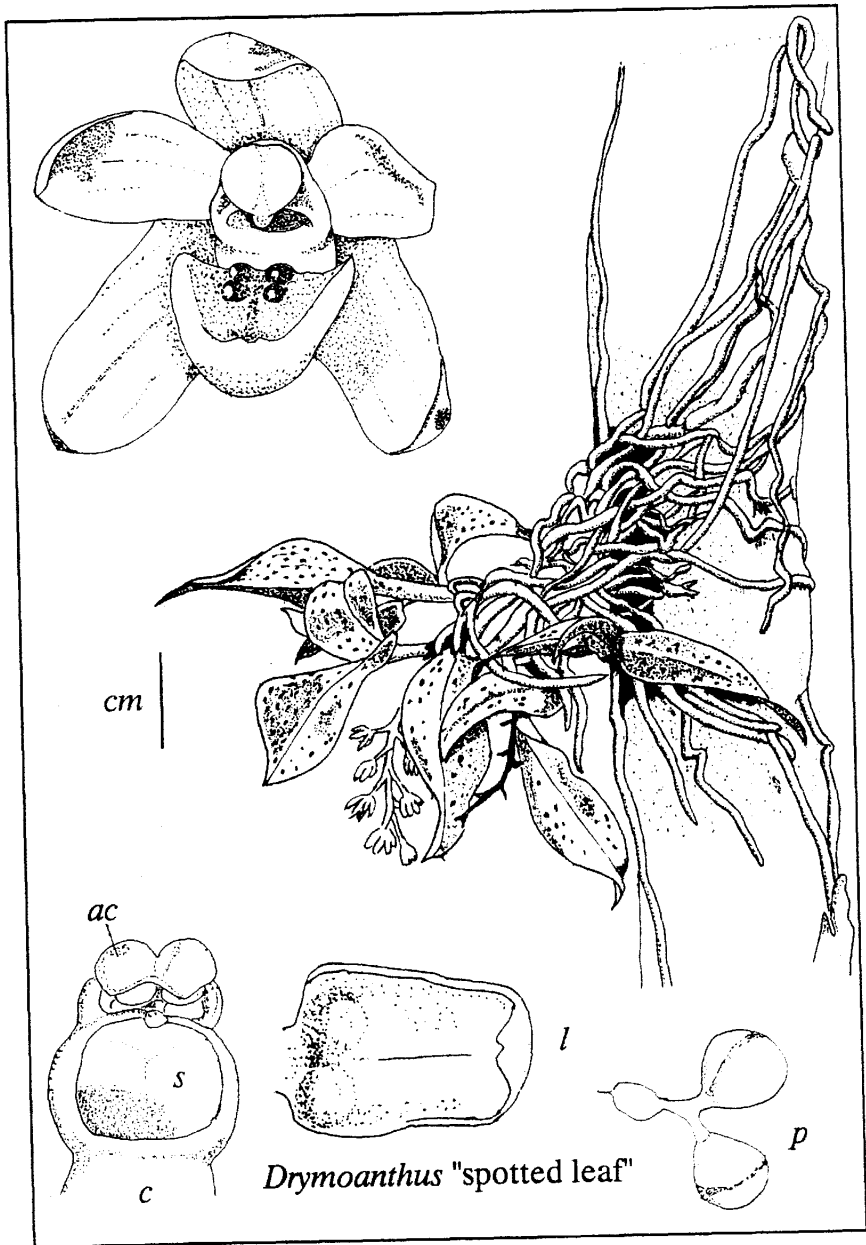
I have since seen it in a number of places, most commonly on totara in coastal groves in the Catlins district, at Sandy Point near Invercargill, Taieri River; on kanuka near Sandymount on the Otago Peninsula; on broadleaf in the Catlins, on mapou in Leith Valley, on miro in the Catlins. Peter Johnson has collected it from Lake Hauroko.

Old flower stems persist from previous years, and small seedlings accompany the parent plants. Several flowers are pendant on the stem, each flower minute, 5mm across, yellow-green with few red markings. The petals and sepals are more or less equal, open, long and oval, the lip cup-shaped, but lacking the transverse ridge of *D. adversus*.

Only a few fruits develop on each stem. It flowers in November, the fruits develop slowly, and do not open to spread seed until the following spring.

Occurrence: rare and local. It flowers from September to December and is predominantly insect pollinated.

Historical note: the Dunedin Naturalists' Field Club minutes for 1936 are in the Hocken Library. In Helen Dalrymple's handwriting is the report of an outing to Leith Valley: "Rare and beautiful native plants grow in profusion. Of these plants pride of place is given to the rarest, the epiphytic orchid *Sarcochilus adversus*, which in this favoured spot grows on three distinct host trees, the broadleaf and the yellow and white mapou or lemonwood The *Sarcochilus* was examined carefully, the bunchy tufts of purple spotted leaves, waxy blooms of yellowish green and withering whitish aerial roots adhering to the bark making a very quaint and interesting study." This was *Drymoanthus* "spotted leaf", and I saw a single plant on white mapou in the same place in 1990. G.M. Thomson made the first record (September 1879): "Johnstone brought to school today a species of *Sarcochilus* from Sawyers Bay, just coming into flower. This is the first time I have heard of this orchid in this part of the Colony." By 1895 he would write, "*S. adversus* is becoming almost extinct in Dunedin."



Drymoanthus "spotted leaf"

Earina Lindley, 1834

A Pacific genus of eleven perching species (three in New Zealand, five in New Caledonia and one each in Tahiti, Samoa and Fiji). Of the New Zealand species, two (*E. autumnalis* and *E. mucronata*) are well known: a third, *E. aestivalis* seems to be a coastal version of *E. mucronata*, but with larger, darker flowers, and a more robust habit with shorter, broader leaves, apparently confined to the west coast from Ahipara in Northland, perhaps to Fiordland and the Chathams.

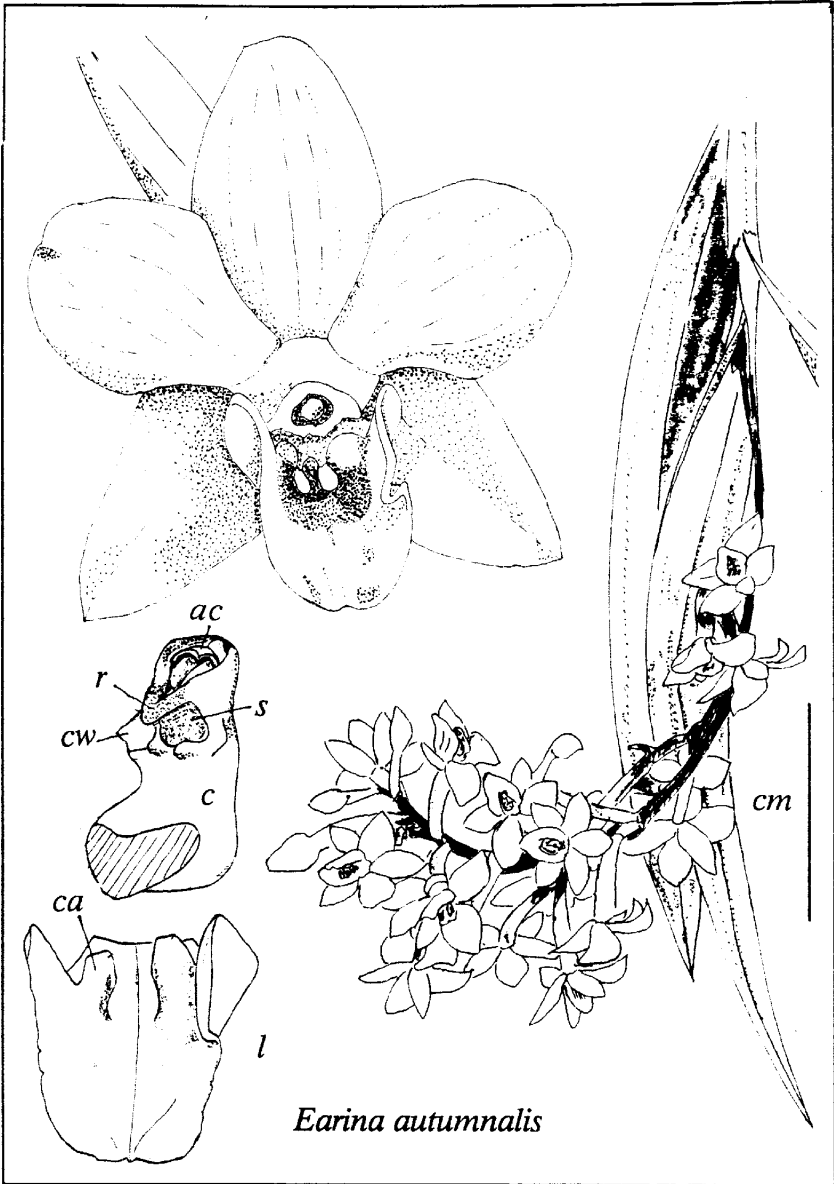
The Earinas bear a number of racemes each with several flowers which are small and hairless. The petals and sepals are similar; the lobed labellum may be uppermost; the column short and cylindrical with a terminal anther and four waxy pollinia; a deep stigma is separated from the anther by a prominent rostellum. Many cane-like, leafy, unbranched stems, more or less enclosed by leaf sheaths; long roots. The leaves arise in alternate pairs, their blades twisted so that they face the same way, and are long and thin.

Cultivation: Earinas can be cultivated as for *Dendrobium* but *E. autumnalis* should be provided with 50% shade. Often best on a mossy log, or in the crook of a tree that receives enough stem-flow from rain.

Earina autumnalis (J.G.A. Forster) J.D. Hooker

Flowering in autumn, the "Easter orchid" (raupeka) is heavily scented. That fragrance attracts the searcher well before the plant is seen.

This is an epiphyte, but will grow on rocks or even on the ground when trees fall or branches break, or when the orchid itself (less firmly attached than the other perching species) falls. The stem stands up if short, but grows to a drooping metre long; it is covered with stiff, 4-10cm long, narrow, pointed, sometimes twisted leaves; it ends with the flower stem, turned upward if the stem is long and drooping. The flower stem carries many blooms, white, half a centimetre across. These are classic orchids in miniature, with broad oval petals and sepals, and a broad, yellow-based lip. I first saw it at Te Anau, growing on the rotted remains of a fallen tōtara. But it is common enough: on Stewart Island, at Hauroko, Key Summit, Tahakopa, Lake Wilkie, Tautuku, Mount Cargill, Port Chalmers, and Silverpeaks. There are islands in Lake Manapouri that have *E. autumnalis* in hundreds growing as extensive mats in moss and liverwort carpets under the beech trees and out onto the lake shore rocks; you can smell the scent well off-shore.



In Dusky Sound J.R. Forster, naturalist on Cook's second voyage, wrote in his diary, "After dinner I went a shore towards the new watering place in our new Anchorage & found a very fine *Epidendrum* in flower, which spread a very agreeable smell." It was *Earina autumnalis*, drawn by George Forster on 29 March 1773. They could hardly have missed it for it is prolific along the shores of Dusky Sound.

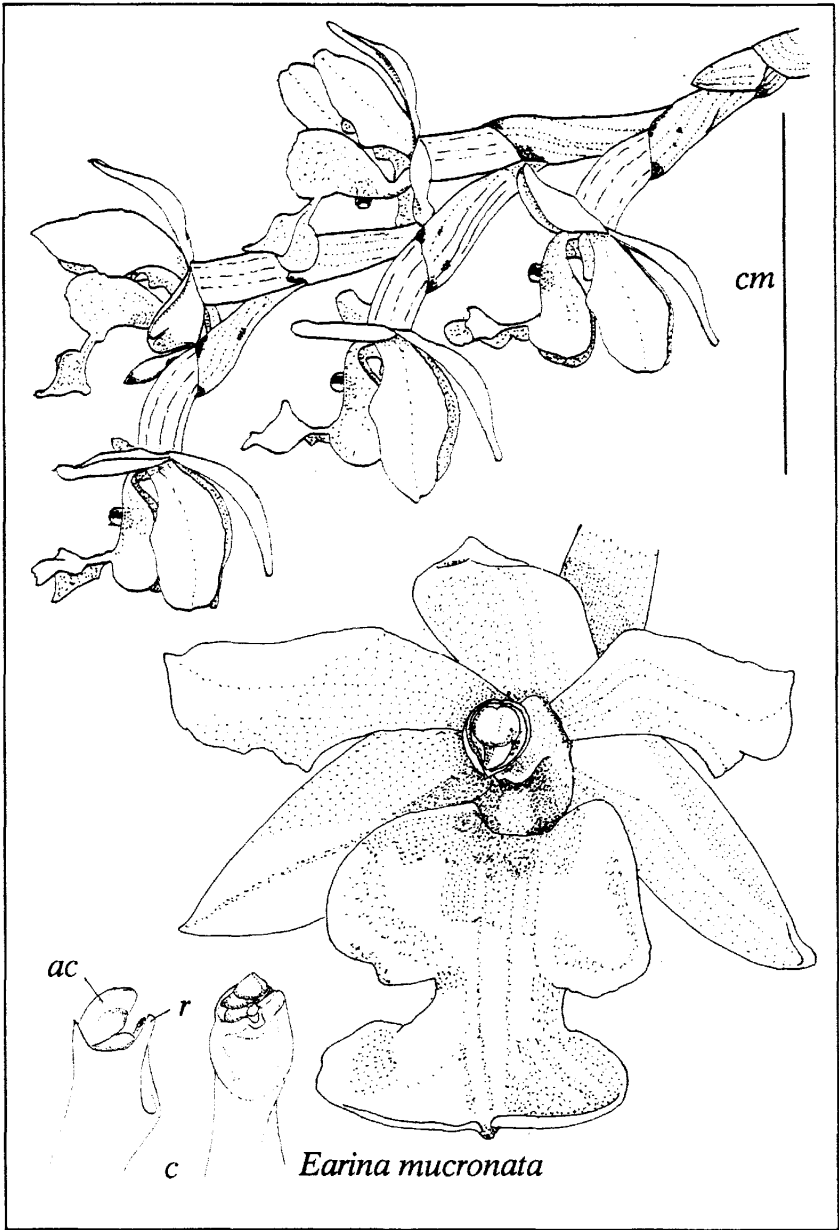
Occurrence: common. It flowers from February to July here, and is predominantly insect pollinated.

Historical note: an early *Otago Witness* reports the following: "When pig-hunting in the Upper Waihera, we got on to a large boar that had given us a few hard runs on previous occasions,' Mr. W. O. Leith writes from Martinborough, Wairarapa. 'He went off on his usual route, with the dogs hard on his trail. His track took him around a long point. I set out for three-quarters of a mile over a fairly steep ridge, in order to get a passing shot at him. I found it very hard to get up the beech face, but reached the top, and I had started to go down through the undergrowth at a good pace when I ran into a bank of perfume. It was the sweetest and strongest perfume I ever smelt. I pulled up, and on climbing back a few yards, saw some flowers growing close to the ground. They were small, whitish, waxy flowers, clustered on hard, wiry stems. I thought at the time that they were the prettiest bush flowers I had seen. When I walked up to them the perfume seemed to change to a pungent smell, like the smell of large yellow garden bulbs. I took some of the flowers, crammed them into my hat, shoved my hat half through my belt, and continued the hunt until the dogs gave out. When I returned to my three mates, we sat down to have a smoke. I hardly had rolled a cigarette when one of them, about six feet away, sat up and asked where the sweet smell came from. I showed the flowers, which were strange to all my mates'."

Earina mucronata Lindley

The commonest of our perching orchids, "peka-a-waka" is found on trees in many lowland forests, but usually near the sea, often in huge grassy-looking mats, covering well-lit branches and trunks. Each stem carries many tiny flowers on drooping clusters in spring (November and December).

The slightly fragrant flowers are creamy-yellow, less than a centimetre across, with oval petals and sepals. The lip is orange, broad and lobed at its base and outer end, with a narrow isthmus between. The leaves are slender and pointed, like stiff grass, with old dead flower stems sticking up untidily among them. The leaf-stems do not branch. The roots form a thick tangled mass attached to the tree bark.



E. mucronata can be found in any open bush, beside tracks. There is a large colony on a broadleaf in an open paddock not fifty metres from Dunedin's northern motorway, another on the cliffs below the Twelve Mile Bluff on the shore of Lake Wakatipu.

Occurrence: common, flowering from October to December. Predominantly insect-pollinated: note the prominent rostellum between the anther and stigma.

Historical note: John Lindley wrote in 1834, "For fine specimens of this we are indebted to Mr. Cunningham who observed it growing commonly in moist woods upon the shores of the Bay of Islands, New Zealand, on mossy rocky banks, and on the limbs of trees, flowering in September and October, which in New Zealand is the season of spring'. From the latter circumstance we have contrived the generic name." Sir William Hooker included *Earina* in a family of orchids he called *Colensoanae*, a tribute, alas, long forgotten. Georgina Hetley wrote in 1888, "The roots of *Earina mucronata* often completely encase the branch on which it grows. The whole plant can be scaled off, when it forms a lovely object to hang up in a fernery, with its numerous heads of pale yellow flowers, hanging on their slender stalks, amongst the long, narrow, grass-like leaves."

Gastrodia R. Brown, 1810

There are four New Zealand "potato orchids" in a genus of about fifteen species ranging from the Himalayas to Japan and into southeast Asia and the Pacific.

They are ground orchids, but have no chlorophyll-containing green leaves. The orchids gain their nourishment via a fungus that is parasitic on tree roots, the fungus supplying food for the orchid.

They bear a single raceme of several to many tubular flowers, the lateral sepals uppermost, the tube containing the oblong labellum which bears longitudinal calli and has wavy edges; the column may be short or long, bearing granular pollen and a basal stigma; the rhizome is bulky and full of starch; leaf vestiges are represented by scales on the stem and rhizome.

Cultivation: The *Gastrodia* are all symbiotic with fungi that depend in turn on living tree roots, and are therefore not recommended for pot culture.

Gastrodia cunninghamii J.D. Hooker

G. cunninghamii is a tall plant, sometimes a metre in height and bearing up to seventy flowers on its one stem. The plant is brown, black or greenish, with only tiny scales on the stem as residual leaves. The flowers are knobby and tubular, formed by the fusion of the petals and sepals which are separated only at their tips. The lip is attached at the inside base of the tube so that only the end shows. The column is much shorter than the labellum, and folds down to place the pollen against the stigma.

It nudges through the ground in spring like a brown asparagus shoot. Sometimes it appears in association with introduced trees (rhododendrons in Dunedin's Botanical Gardens), but in the wild it is found beneath open beech forest, in the Catlins, the Longwoods, the Lakes district, Stewart Island.

Occurrence: common in the south. Flowers in December and January. Predominantly self-pollinating.

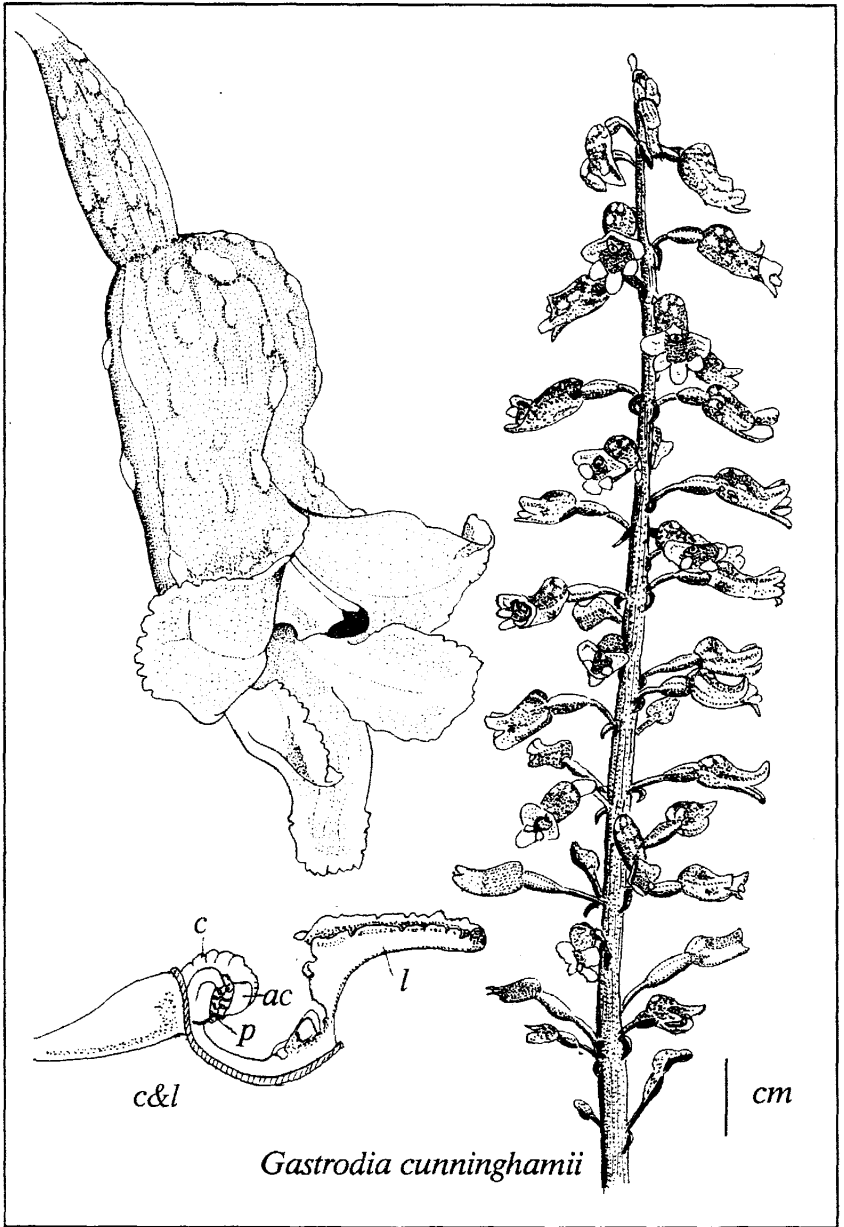
Historical note: Colenso wrote of the vegetable foods of the Maori in 1880, "Another fleshy root, and that a tolerably large one, of the Orchis family, often the size of a middling-sized kumara tuber, or of a stout, long-red radish root -- the perei (*Gastrodia cunninghamii*) -- was also eaten." In 1884 he added "I have good reasons for believing that it is gradually becoming more scarce -- like many of our native plants It is leafless, and has a strange appearance, reminding one at first sight of the larger British species of *Orobanche* (Broomrape).

*"Leafless, however, and rapid, up darts the slenderer flower stalk,
And a wonderful picture attracts the observer's eye.*

(Metamorphose der Pflanzen. Goethe)

"Its root, a tolerably large cylindrical tuber, is perennial; its single scaly and spotted flower stem is 2 feet and more high, stout, erect, and bears several pretty large and peculiar bizarre flowers. The root was eaten by the old Maoris."

Elsdon Best wrote of the Tuhoe who foraged for their food in steep country unsuitable for cultivation: "Some singular notions prevail among the natives in regard to the perei. It did not, according to the Maori, originate in or from the earth, but was formed by the gods. Again, when engaged in digging for the roots the word perei must not be mentioned or no roots will be found. At such a time it is called maukuku."



Gastrodia minor Petrie

G. minor is a small version, shorter and with fewer (up to ten) flowers. Less than 30cm tall, though usually only 15cm or so, it has been seen in recent years in the Twelve Mile Creek near Queenstown (associated with gorse), in tussock grassland on the Horse Range near Trotter's Gorge, at Gabriel's Gully, Herbert State Forest and at Waituna Lagoon.

It is light brown overall, the thin tubular flowers containing the labellum and a much shorter column.

Occurrence: rare here. It flowers in December, and is self-pollinating.

Historical note: Donald Petrie found it first under *kanuka* in Dunedin's Town Belt, and later at Opoho Creek. He wrote in 1892: "I had the good fortune to find both plants (*Gastrodia cunninghamii* and *G. minor*) in flower in the neighbourhood of Dunedin at the same time, so that a very complete comparison of the two species was practicable." By the turn of the century it had disappeared from these areas, "choked out, in all likelihood by stronger and coarser aliens," according to G.M. Thomson.

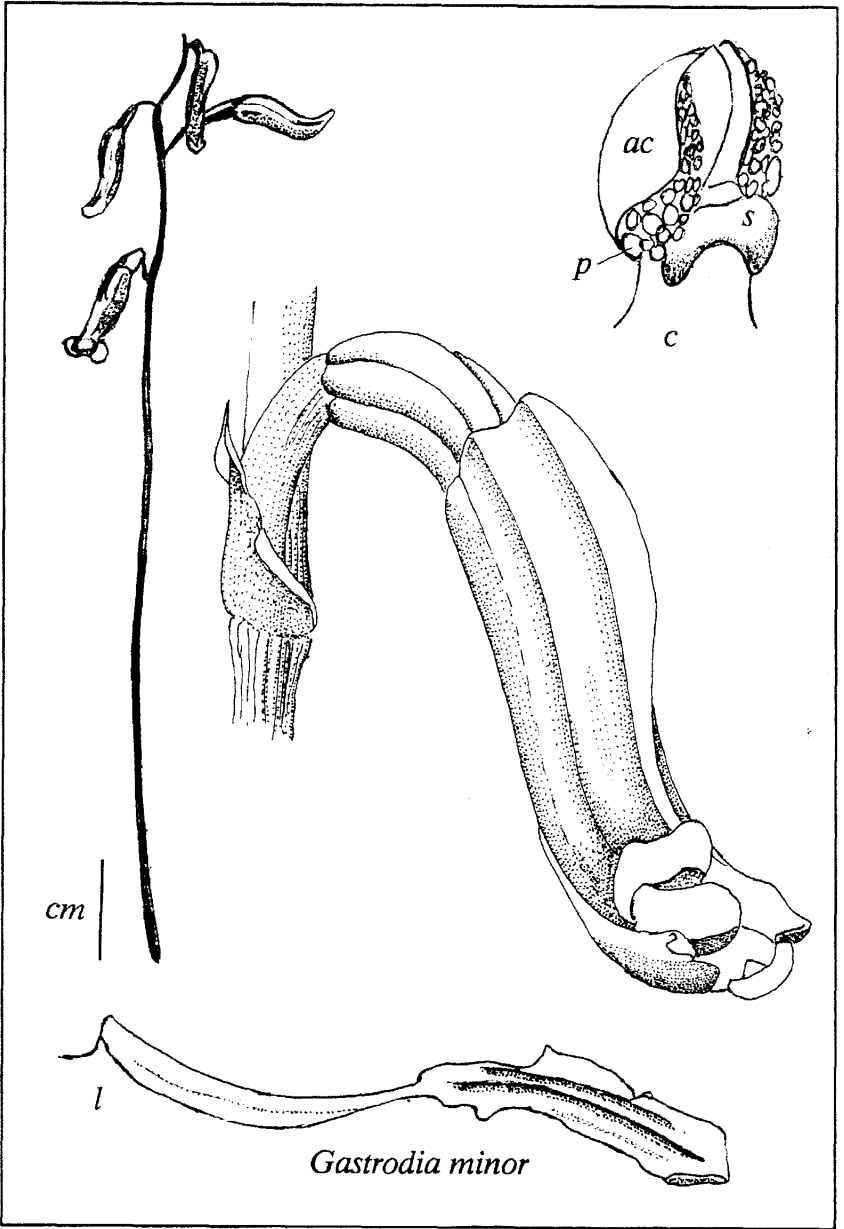
Gastrodia "long column"

G. sesamoides is a northern New Zealand and Australian species, known across the Tasman as "cinnamon bells" for its spicy scent, and most clearly distinguished by a column as long as its labellum.

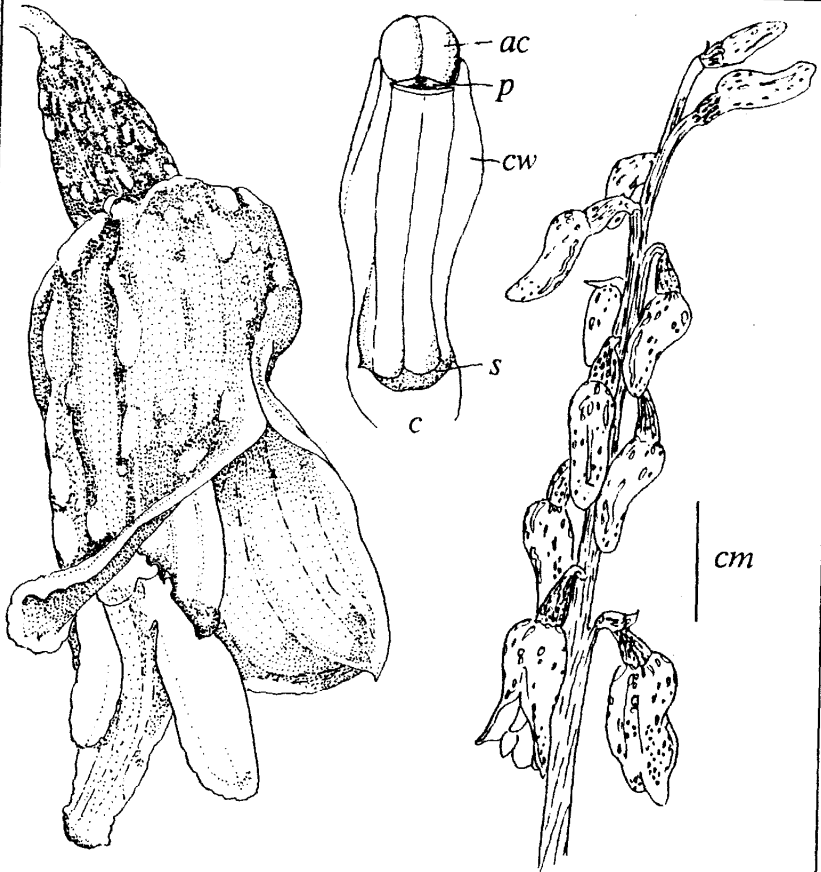
A similar plant with a long column has been recorded for some years from different parts of New Zealand, and has been confused with *G. sesamoides*. The differences were recognised by Hugh Wilson, who wrote of what he called *Gastrodia* "long column" from Stewart Island. Gordon Watson and David McNaughton found a large colony at Waituna Lagoon, and in 1990 Stella and John Rowe found it near Lake Hawea. This is a tall (80cm), stout, light brown plant, the stem bearing forty or so flowers.

Occurrence: rare. It flowers in January, and is self-pollinating.

Historical note: Hugh Wilson, who first recognised that this was an undescribed species, wrote in his *Stewart Island plants* (1982): "These plants are more robust and densely flowered than *G. cunninghamii*; they also flower a month later. The long column inside the flower suggests an affinity with *G. sesamoides*, but this plant differs from that species in other respects and its relationships are not yet determined."



Gastrodia minor



Gastrodia "long column"

Lyperanthus R. Brown, 1810

A genus of less than a dozen species, only one in New Zealand (although Clements has recently divulged that there is a specimen of *L. nigricans*, probably mislabelled but said to have been collected in New Zealand by W.T.L. Travers [1819-1903] in Vienna). There is some doubt about the placing of our *L. antarcticus* in *Lyperanthus*.

Lyperanthus antarcticus J.D. Hooker

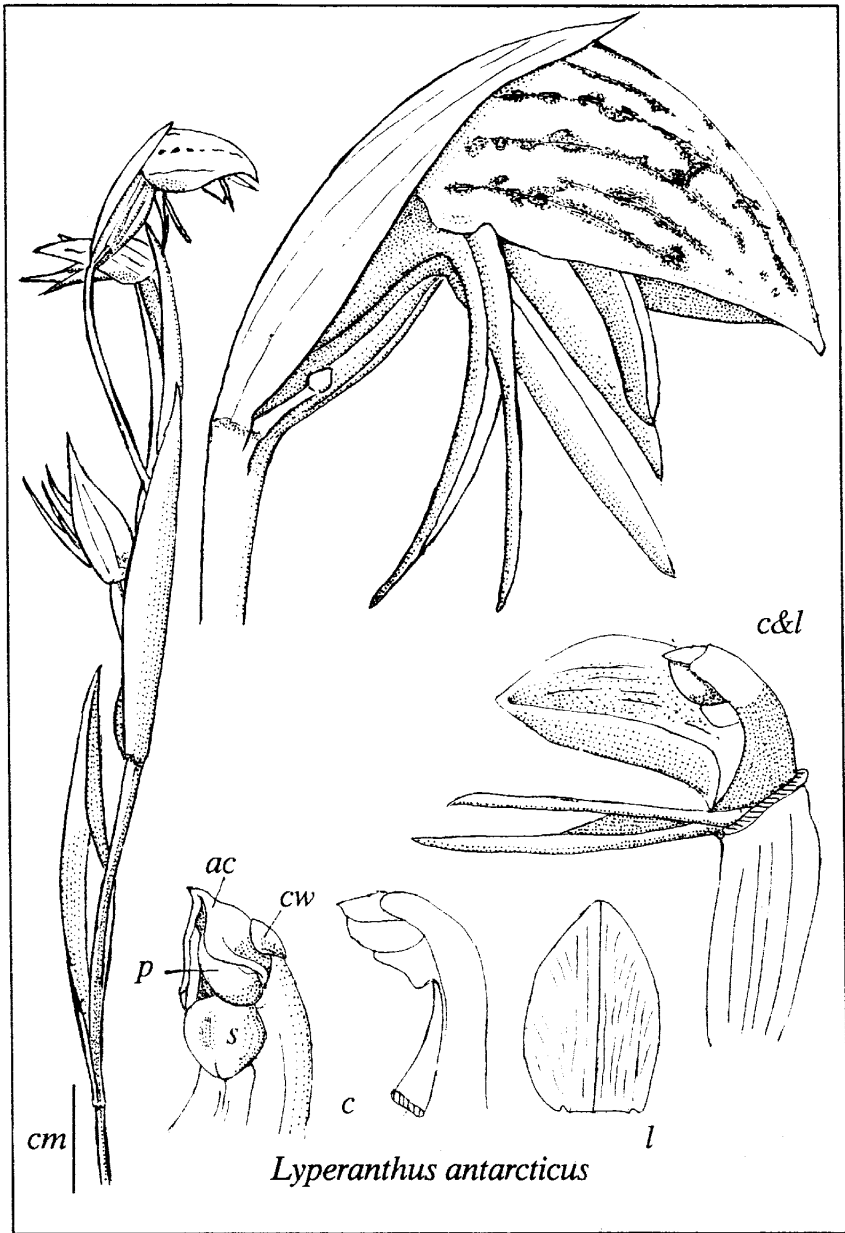
This upright, stiff, 10cm plant has a pair of long narrow leaves hugging the stem which bears two or three flowers. These are 1-2cm long, yellow-green with brown blotches on a caplike hood which arches over and hides the rest of the flower. Often a vestigial bud is found beneath the top flower.

The "yellowbeak" is hard to find. It favours a wet, peaty, mossy habitat in high cold places. Swampy Summit and Mt Cargill near Dunedin, on Maungatua, the top of the Longwoods, in Fiordland and common on Stewart Island. It becomes even rarer as the swamps are drained.

Occurrence: fairly common. Flowering is from December to February. The species is predominantly self-pollinating.

Cultivation: *Lyperanthus antarcticus* likes a basic mix with the addition of one part coarse sand. Shade 50%. Colony forming.

Historical note: J.D. Hooker did not at first recognise specimens found on the Auckland Islands, and wrote in his *Flora antarctica* (1844) "The plant has some points in common with *Chiloglottis* R.Br., but the leaves are not like those of that genus." He realised what it was during the printing of the work, though, and wrote in the Appendix, "*Lyperanthus antarcticus* Though somewhat different in habit from the New Holland species, I do not think that this can be generically separated from them."



Microtis R. Brown, 1810

About fifteen species of "onion orchids" range from southeast Asia to New Zealand, which has three, two of them in our region.

Perhaps the least exciting of our native orchids, these are common grassland plants, with rather insignificant flowers. They are hairless orchids, with a single raceme of many green flowers, the dorsal sepal uppermost, forming a hood over the flower, the lateral sepals of much the same length, the petals shorter; the labellum is oblong to oval, more or less hanging down, with calli at its base; the column is short with membranous wings, the anther terminal above an oval stigma; tuber oval; the single leaf more or less round in cross-section, and sheathing the stem for some distance.

Cultivation: basic mix with one part more sand added. Full sun to 30% shade. *M. unifolia* is an easy grower and is most impressive when mass displayed in large pots. It responds to fertiliser and has few pest or disease problems, other than rust. *M. oligantha* prefers wetter habitats than its relatives, so the mix should have extra leafmould and soil added; being a higher altitude species *M. oligantha* should be kept cool.

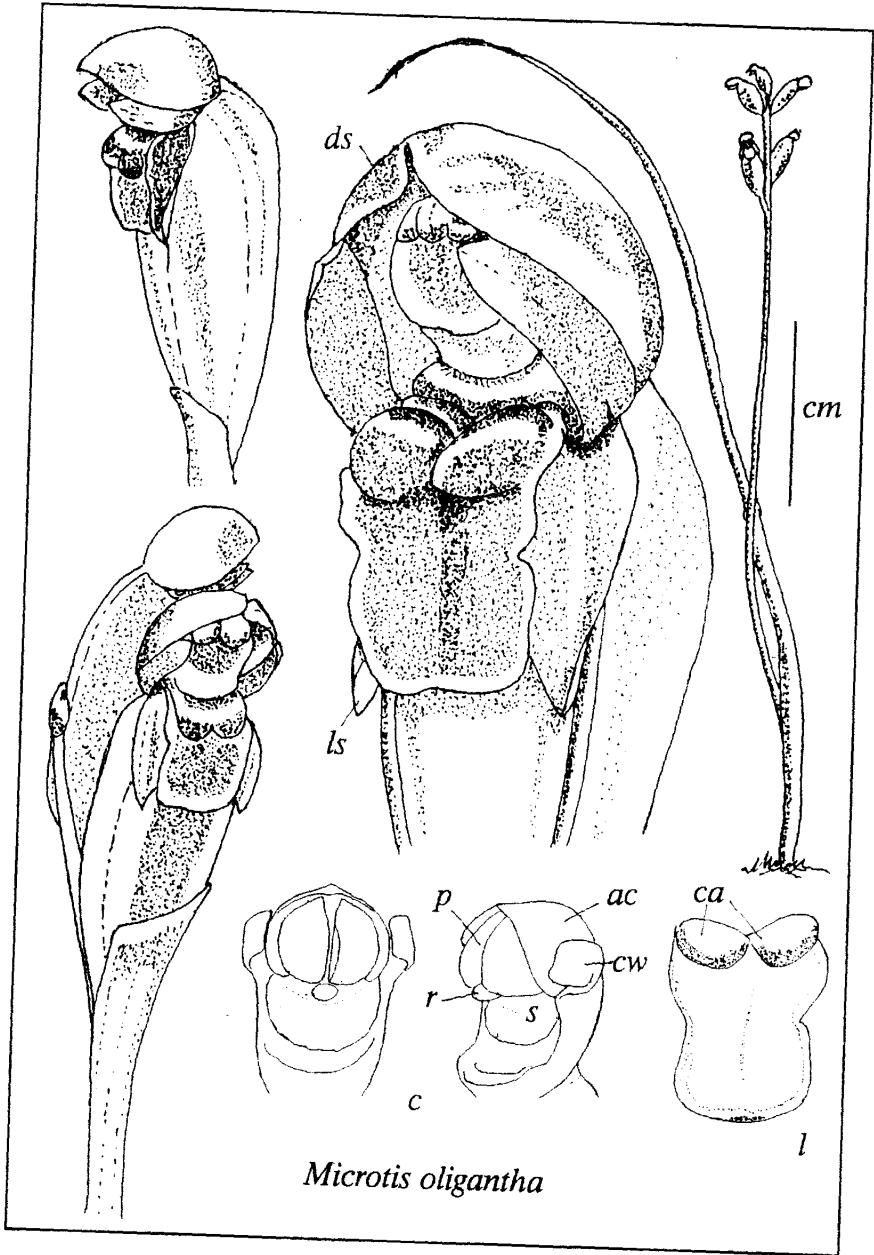
Microtis oligantha L.B. Moore

The lesser onion orchid, *M. oligantha*, has been found at Shag Point, Table Mountain in the Catlins, the Mavora Lakes, Caples river valley, the Rees Valley, on the shores of Lake Wakatipu, at Skippers and on Stewart Island: damp turf or grassland, flushed ground on open hillsides, or turfy lake shores.

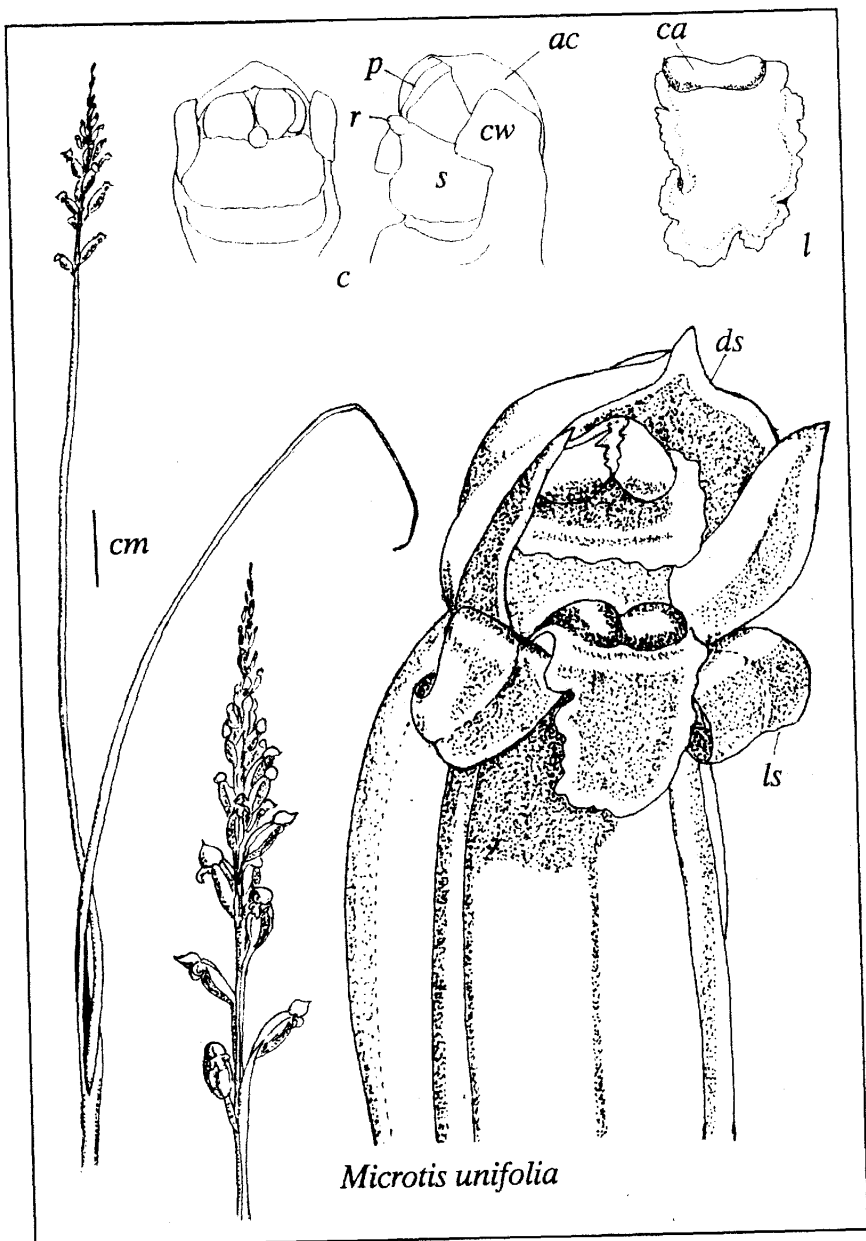
Compared with *M. unifolia* it is small (often less than 5cm tall), has fewer than ten flowers, with a rounded dorsal sepal, a more regularly oblong labellum, straight rather than curled lateral sepals, and column wings that turn back, then forward. The flowers are green, but tend to whiten with age.

Occurrence: common locally, it flowers from December to February and is predominantly self-pollinating.

Historical note: Dan Hatch recognised that this was a new species for New Zealand in 1963, but mistook it for the Australian *M. magnadenia*: "The most striking points of identification to the casual glance are the few (no more than 4 in the plants I have seen) loosely arranged flowers, the long slender pedicels and the large round dorsal sepals."



Microtis oligantha



Microtis unifolia

Microtis unifolia (J.G.A. Forster) H.G. Reichenbach

The common onion orchid, as its generic name suggests, has minute flowers. The plant can be quite tall, but usually grows to less than 30cm, fleshy stemmed with an onionlike leaf and many green-yellow flowers of 3mm diameter. You really have to look hard to recognise these as orchid flowers, but each does have the characteristic arched hood (its tip upturned, compared with the blunt tip of the hood of *M. oligantha*), petals beneath it, the lateral sepals curled to either side, and the broad, rough irregular lip below.

Hundreds can be seen in the open, on clay banks, tussock grasslands, roadsides, sometimes in swampy sites: in any relatively unchanged damp pasture.

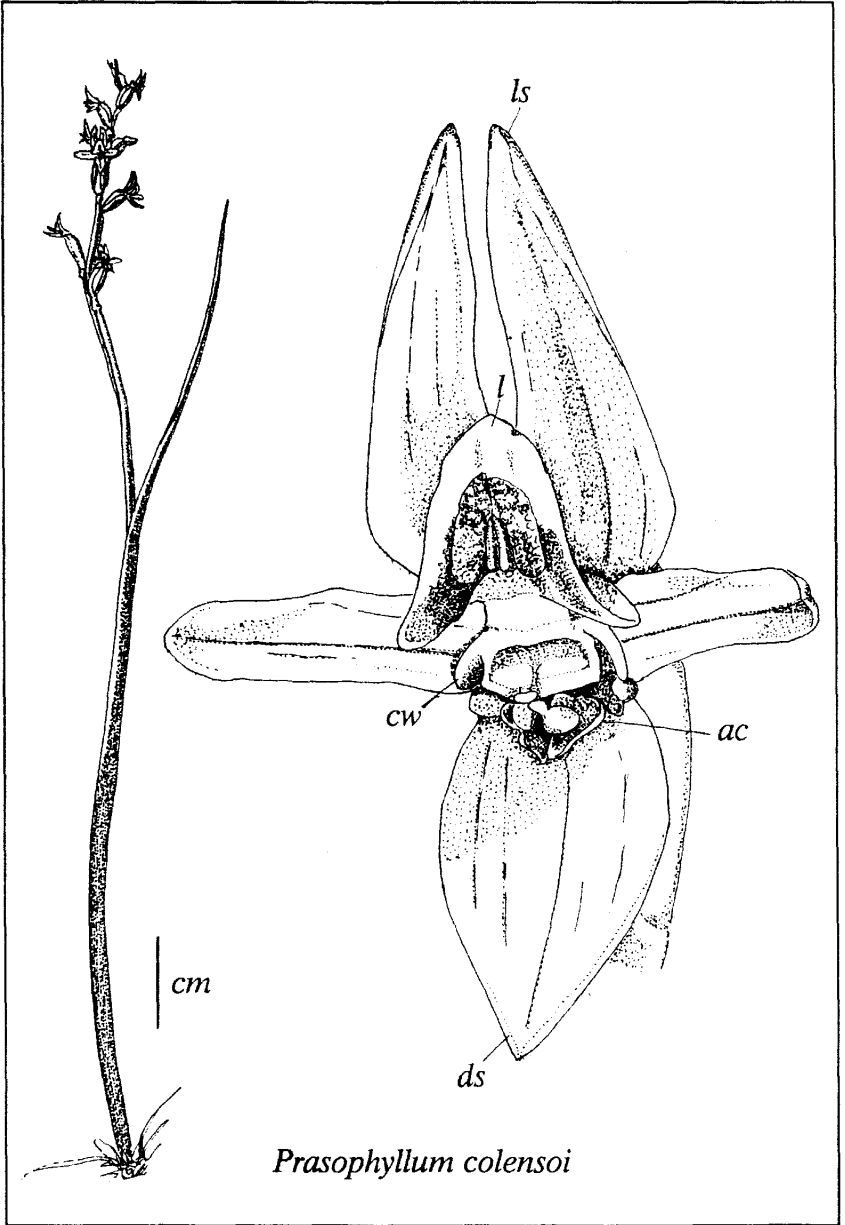
Occurrence: very common. Flowers from November to January. Predominantly self-pollinating.

Historical note: J.R. Forster wrote in his diary at Queen Charlotte Sound on 13 November 1773, ". . . went over to Long-Island & mounted the hill, where we found several fine plants We returned to dinner, having found a new Orch." It was *Microtis unifolia*, described in 1786 by his son George Forster as *Ophrys unifolia*.

Prasophyllum R. Brown, 1810

Clements listed eighty-one Australian species (though the pygmy *Prasophyllum*s have since been reclassified as belonging to the genus *Genoplesium*), and there are more from New Caledonia.

New Zealand has two, but only one grows in our region. They are ground orchids, hairless, with racemes of many flowers, the labellum uppermost. The dorsal sepal is often curved backward, the lateral sepals narrow, the petals shorter. The labellum is more or less trowel-shaped, the column short, stigma discoid., rostellum prominent, tubers oval. The single leaf is tubular and sheathes the stem for a variable distance.



Prasophyllum colensoi

Prasophyllum colensoi J.D. Hooker

The "leek orchid" is interesting in that its flowers appear to be built upside down, the lip uppermost.

It can be quite red: there is (or there was, until the dreadful exotic conifer weeds took over) a colony of them on the old miner's track from Sunshine Bay to Moke Lake near Queenstown that are larger, redder, and much more attractive than the usual greenish-yellow.

The plant is 15-30cm high, an upright ground orchid bearing a solitary leaf, tubular and grooved. Several flowers are evenly spaced up the stem, each about half a centimetre across. Easily found in any open tussock or grassland, often in damp grassland or sedge areas of swamps or swamp margins. Smaller plants with fewer flowers occur at altitude: I have seen it at over 1000m near Centre Pass on the Manapouri to Dusky Sound track.

Occurrence: very common. Flowers from December to January. Predominantly self-pollinating.

Cultivation: basic mix with one part more sand. Shade 30%. Water sparingly and it will grow well.

Historical note: G.M. Thomson noted in 1878, "The flowers are somewhat sweet-scented, and though dull-coloured, are tolerably conspicuous, but there appears to be no trace of a nectary. Nor from the position of the parts is it very probable that an insect could remove the pollinia, so as to place the loose, incoherent grains on the stigma of another flower. The species is evidently well fitted for self-fertilization."

Pterostylis R. Brown 1810

Perhaps ten of New Zealand's "greenhoods" grow in the south. There are many more in Australia (Clements lists a hundred species and several natural hybrids), New Caledonia and New Zealand, which has twenty-five.

They are ground orchids whose flowers are green, the dorsal sepal and petals forming a hood, the lateral sepals often pointed and joined together. The lip is small and mobile, and with the column is mostly contained within a cylinder formed by the other segments of the flower; it sometimes has an appendage which has a frilled end. The column is long, with more or less

oblong wings on each side of the rostellum, a terminal anther bearing four crescentic pollinia.

The stigma is two-lobed, elongated vertically usually, in the middle of the column. Tubers ovoid. Several leaves may form a rosette at the base of the stem, or may be distributed up the stem, when they are variously shaped but mostly long and thin.

They are recognised as tutukiwi ("standing kiwi") by the Maori. These plants trap insects, but they are not carnivorous like the Venus flytrap. When an insect touches the sensitive lip of some species it springs backward to form a narrow tube with the column. The trapped insect escapes through this tube, picking up the sticky pollinia for the next plant as it goes. The lip can be triggered in a live flower by a light touch.

Both the small New Zealand greenhoods with basal rosettes of leaves, and multiple flowers on the stem (*P. "aff. cynocephala"* and *P. tristis*) grow in the south; as does *P. foliata* (with rosette leaves); *P. venosa* with its broad leaves; *P. areolata* and *P. australis* with their broad lower leaves and narrower upper ones; *P. banksii*, *P. graminea*, *P. montana* (and at least one undescribed species tagged *P. "aff. montana"*) with their narrow leaves; but we have none of the winter-flowering species.

The greenhoods are difficult to distinguish; a revision of their taxonomy will no doubt change some of the following classification.

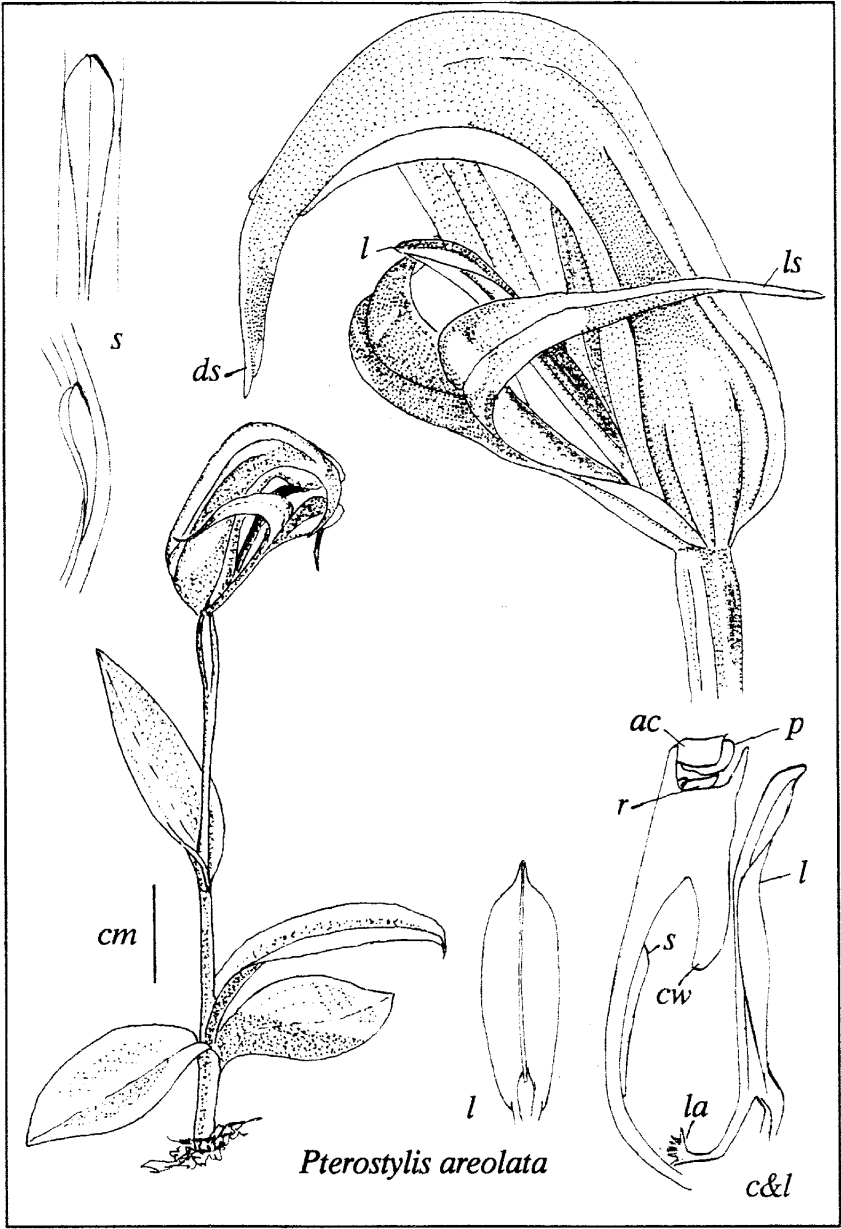
Cultivation: basic mix with shade of 50% and pots kept evenly moist. Almost all New Zealand greenhoods are readily cultivated.

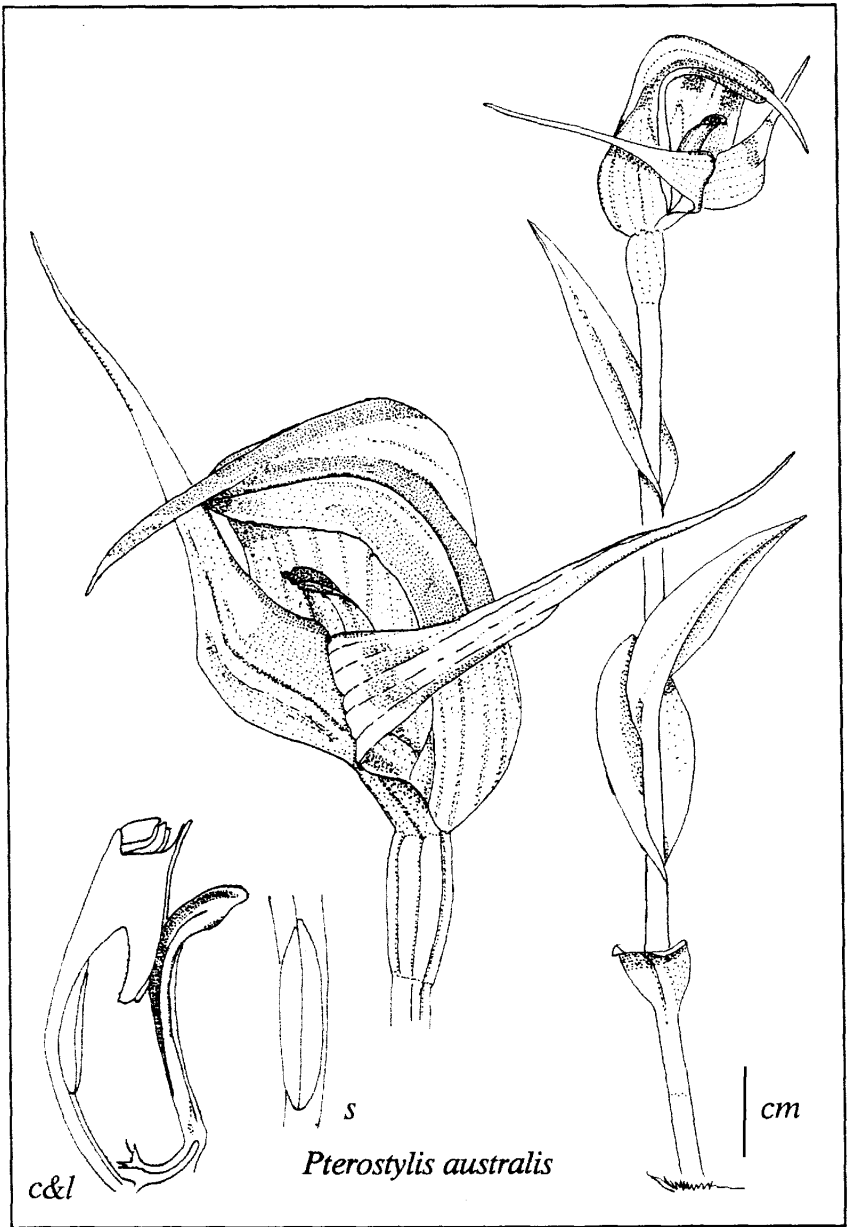
Pterostylis areolata Petrie

An inhabitant of grassland and light scrub, in the Taieri Reserve and on the Maungatua; also near Oamaru. About 15cm tall, with two to four green, rather broad, oval, membranous leaves, the uppermost smaller than the others, rarely overtopping the flower. The single green (sometimes with red or dark brown tips to the caudae) flower has a dorsal sepal with its tip downturned, the lateral sepals rather short and often turned back and down. The petals are broad to their tips, and are shorter than the dorsal sepal. The labellum is elliptic and little arched; the column as tall, with a long stigma.

Occurrence: local and uncommon, it flowers from October to November, and is predominantly insect pollinated.

Historical note: Petrie first described it in 1918 from specimens collected by Cockayne and Kirk in Marlborough and Canterbury.





Pterostylis australis J.D. Hooker

Many orchidologists doubt the existence of *P. australis* as a distinct species, and indeed, plants I have seen that fit the usual description in Fiordland (e.g. Cascade Creek on the Milford Road) grow in the same colony as typical *P. banksii*. Others seem to merge with the undescribed species tagged *P. "aff. montana"* common around Dunedin.

The species is described as 10-25cm tall, with four to five leaves, shorter than those of *P. banksii*, the shape changing from below upwards, the lowest elliptic, the uppermost grasslike, few of them overtopping the flower.

The single flower has an elongated dorsal sepal, and lateral sepals that are greatly extended in their points, considerably overtopping the rest of the flower. Otherwise the description of column and labellum are as for *P. areolata*, though the stigma is described as long-oval, often as broad as the column, overlapped by the wings from above.

Occurrence: common. Flowering from November to December. Predominantly insect pollinated.

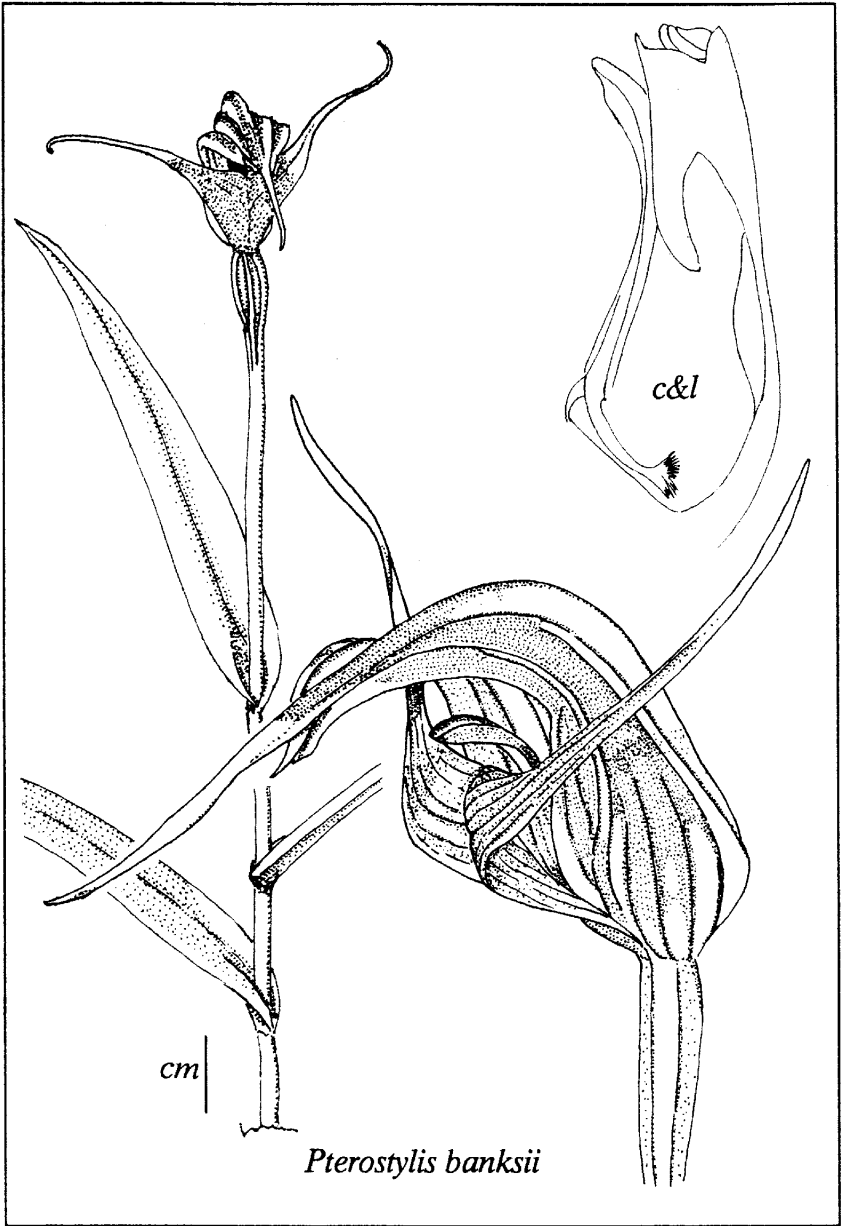
Historical note: J.D. Hooker wrote in his *Flora Novae-zelandiae* (1853) that *Pterostylis australis* was "Nearly as large as *P. banksii*, but the leaves are shorter, broader, not keeled, reticulated." Owen Gibson, Dan Hatch and Bruce Irwin thought (1953) that "further investigation on the variability of the groups within the *P. australis-banksii* complex is required. Probably only one, polymorphic, group is present." Lucy Moore (1970) thought, though, that it was "useful to retain the concept of *P. australis* for the very abundant and often very large Fiordland plant . . ."

Pterostylis banksii R. Brown ex A. Cunningham

P. banksii is a magnificent greenhood. Mostly green it may be, but it seems to express the panache of orchids. It grows on sheltered banks: there are groves of them by the Haast Pass road near the summit, and I have photographed large ones in the Greenstone valley; also the Catlins, Longwoods, Fiordland, Woodside Glen, Trotter's Gorge: any bush track.

The plant grows to 30cm tall, its four to six leaves long and narrow, up to 25cm long. The flower itself can be 5cm high, the long tips of the dorsal and lateral sepals often red in contrast to the green and white flower.

The petals are much shorter than the dorsal sepal, the labellum and column of much the same height, and the stigma long, narrow and not very prominent.



Occurrence: common; flowering from October to December. Predominantly insect pollinated; the forward-leaning column makes it unlikely that pollen will fall onto the rather flat stigma.

Historical note: in 1826 Allan Cunningham found *Pterostylis banksii* on the bank of a stream in the Bay of Islands; it was over 30cm tall. He described it as "remarkable for the noble size of the flower", took some to Sydney, and later sent them to Kew by which time they had died back to tubers and were presumed dead. But the next season everybody was surprised to see a perfect specimen emerge, to flower, and to be painted by Francis Bauer. His painting appeared in Curtis's *Botanical Magazine* of 1832.

Pterostylis "aff. *cycnocephala*"

What we have known as *P. cycnocephala* Fitz. (now thought to be distinct from that Australian species, but with affinities to it) and *P. mutica* R. Brown (now thought to be distinct from that Australian species, and known in New Zealand as *P. tristis* Col.) are tiny: 5-10cm tall with a basal rosette of oval leaves and a stout stem covered with sheathing leaves. Many of the specimens in local herbaria labelled *P. mutica* are in fact *P. "aff. cycnocephala"*, and no doubt collectors have confused them often.

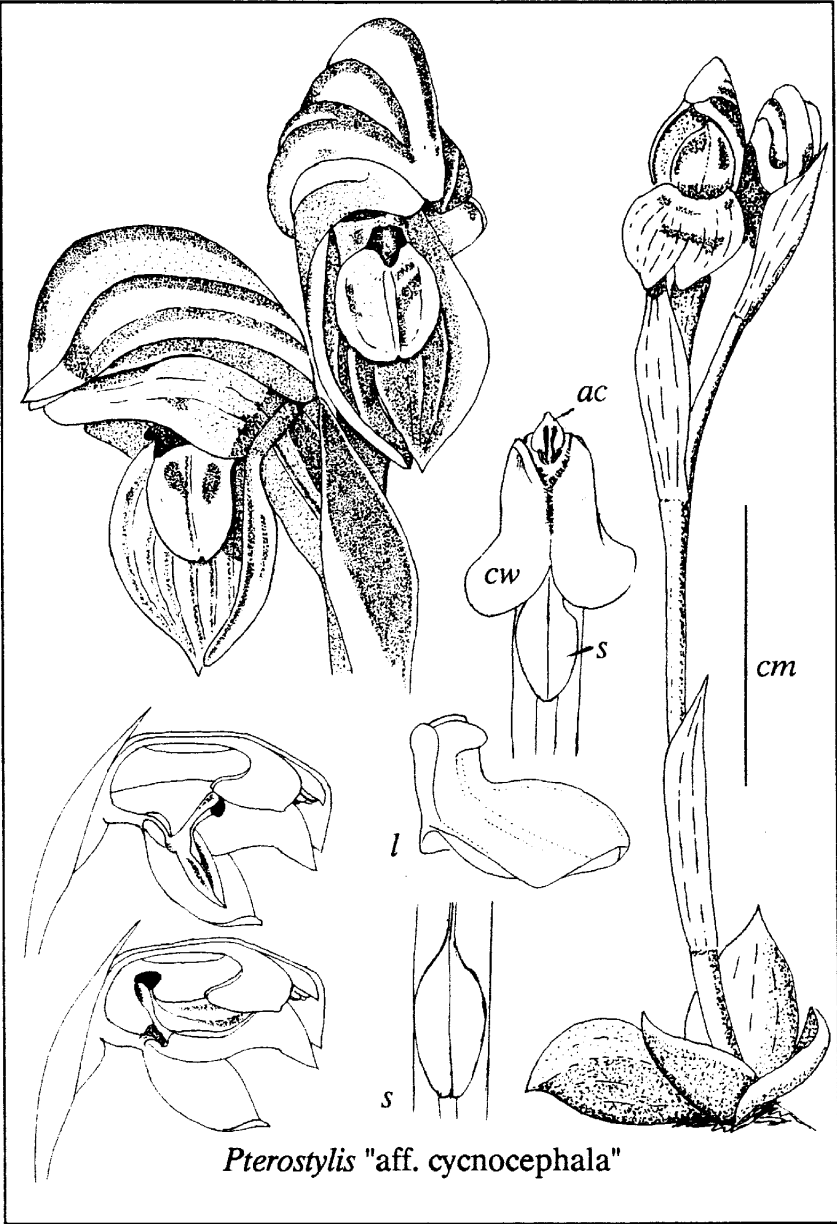
P. "aff. cycnocephala" has between one and seven flowers on the stem, blue-green and white striped, each up to a centimetre in height. The dorsal sepal and petals are broad and short, the lateral sepals joined almost to their tips to form a downward-pointing platform on which the labellum lies. The labellum is short and blunt, and at its rear end has a large appendage with a knob that juts forward.

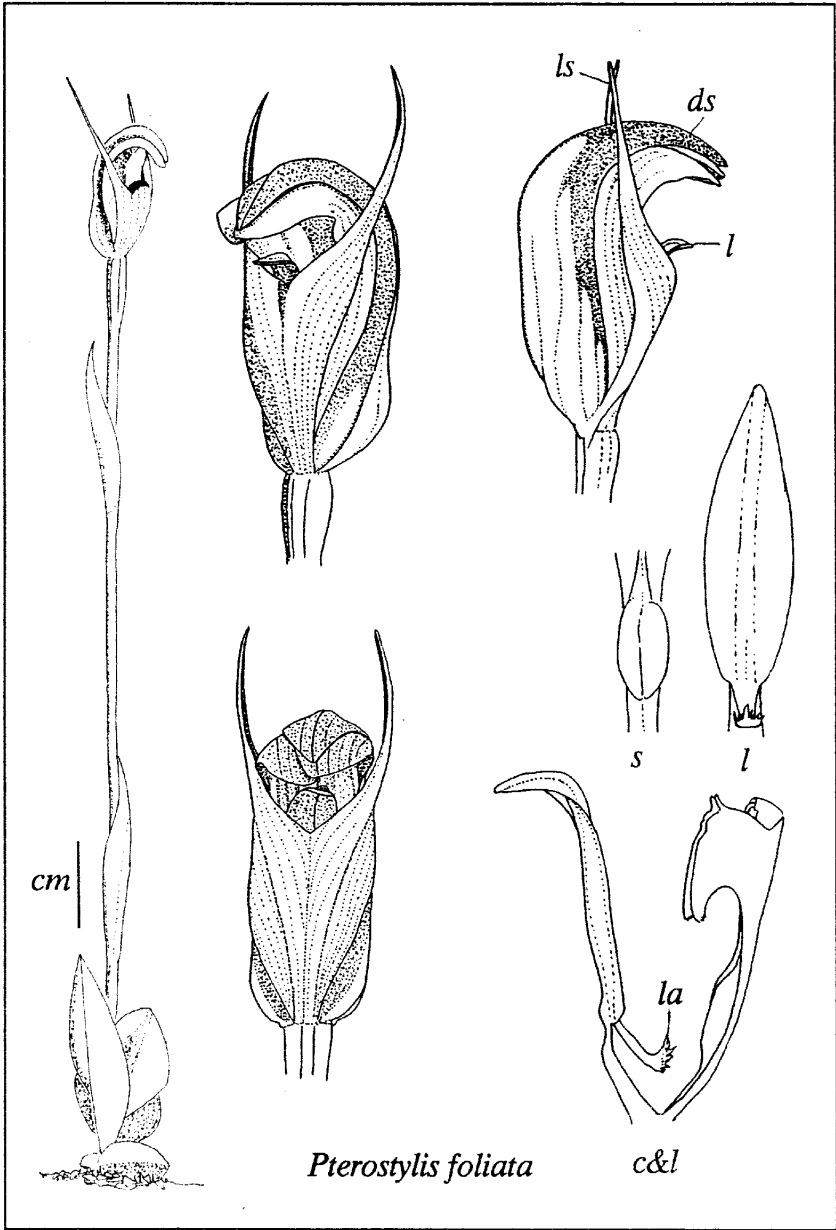
The column is short and wide, with broad hairy wings; the stigma is oblong.

I have seen it on Queenstown Hill, and on the hills around Trotter's Gorge, inland from Waianakarua, and on the Knobbies.

Occurrence: difficult to find, but it flowers from December to January. Predominantly self-pollinating.

Historical note: the Australian naturalist-artist Robert FitzGerald had described *P. cycnocephala* in 1876, and, as Hatch wrote in 1953 "was not quite sure in which taxonomic category the plant belonged, and was inclined to blame his indecision upon the lack of any definite taxonomic rules. Actually the rules are no less vague at the present time, and the category in which a particular new species is placed is largely a matter of personal opinion."





Pterostylis foliata J.D. Hooker

P. foliata is a tall, slender greenhood, up to 30cm in height, the oval, short leaves mostly crowded into a sort of rosette at the base, with a couple of longer and thinner leaves hugging the stem. The single flower is erect, about 2cm tall, the dorsal sepal horizontal, the petals as long, and broad to their tips. The lateral sepals have erect, rather parallel tips overtopping the rest of the flower. The labellum is narrow and triangular, the column shorter, the stigma oval and prominent.

I have seen it only at Shag Point, and on the Horse Range, near Trotter's Gorge: in open grassland, or on clay banks under manuka.

Occurrence: rare in our region, flowering in November. Self-pollinating.

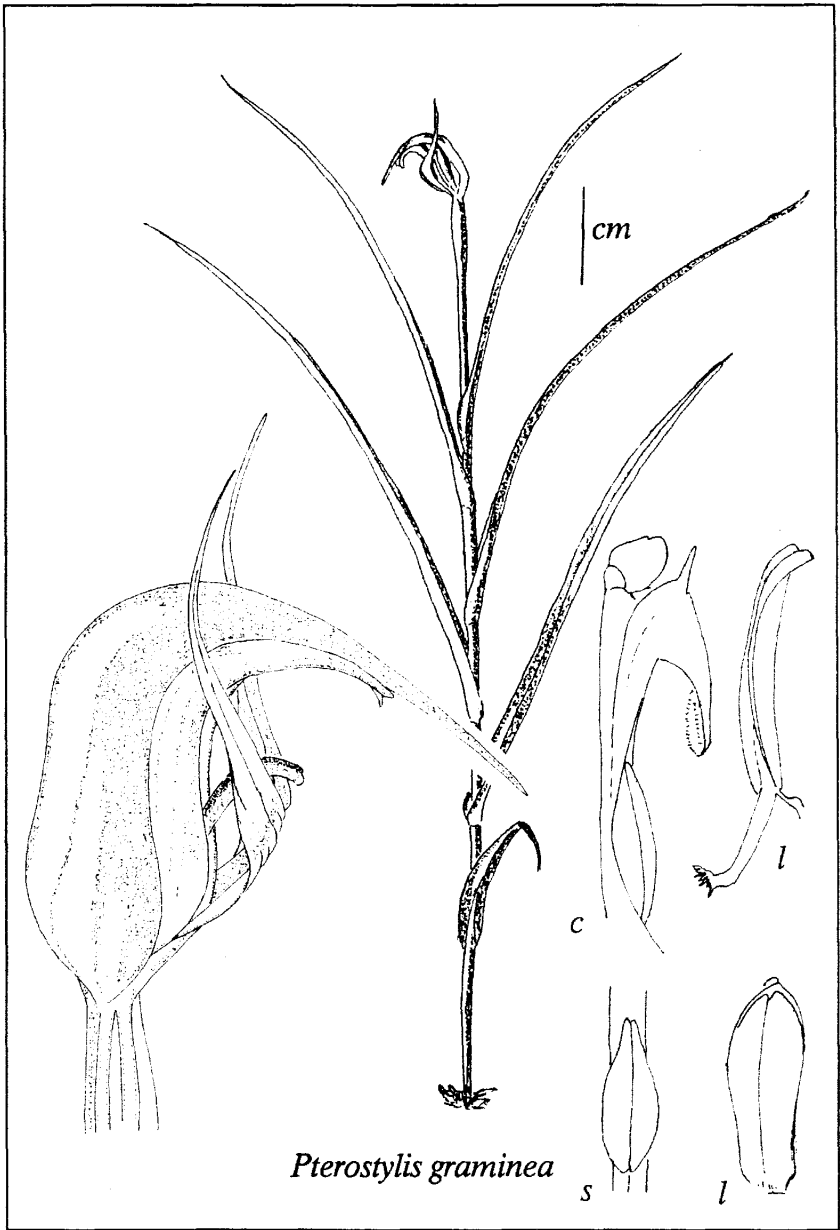
Historical note: Donald Petrie reported this species from Signal Hill, Milburn and Tuapeka Mouth in 1895. G.M. Thomson noted in his diaries, "collected about Black Jack's Point and Signal Hill", and the *Otago Witness* reported that it had been seen on an outing of the Dunedin Naturalists' Field Club to "Waterworks Creek" in 1894. I have seen it in none of these places, perhaps because, as the Field Club minutes of 1894 relate, "A patch of *Pterostylis foliata* was run against and was eagerly collected." Or perhaps because early reports wrongly identified the plant, for as the *Otago Witness* of 14 December 1895 reported of the Waterworks Creek specimens, "This has since turned out to be *Chiloglottis cornuta*."

Pterostylis graminea J.D. Hooker

P. graminea is a slender plant, the four to six leaves keeled, narrow and erect, overtopping the flower. The flower is small, 1.5cm tall, its dorsal sepal up or downcurved, the petals broad to their tips and a little shorter, the lateral sepals sharp-pointed and erect. Labellum and column are of about equal height, the stigma narrow. Growing in dark bush and scrub, by bush tracks around Dunedin: Graham's Bush, Mt Cargill, the bush above Chingford Park, Taieri River Walkway, Trotter's Gorge, Evansdale, scattered localities on the Otago Peninsula.

Occurrence: common, flowering from November to December, and predominantly insect pollinated.

Historical note: Helen Dalrymple and the schoolgirls "finally discover two rather poor plants of *Pterostylis*, also under manuka, and not far from the Logan Point Quarry. . . . We know there must be far better specimens somewhere in the neighbourhood; but the morning is nearly over, and we scurry down by various breakneck routes to catch the 11.35 a.m. train . . ."



Pterostylis montana Hatch

At least two similar plants have been called *P. montana* by Otago naturalists.

The true *P. montana* usually has an overall bronze colour with varying amounts of grey and red. The leaves are narrow and erect. The flower is squarish, with a rather blunt dorsal sepal and petals, and blunt, more or less flat tips to the lateral sepals, which are often curled forward and do not overtop the rest of the flower. The labellum is oblong, its tip very twisted to one side or the other, its midrib prominent, and longer than the column. The stigma is short and heart-shaped, overlapping the column at the sides.

It grows on the hills around Dunedin, at Papatowai, Stewart Island, less common than its undescribed relative *P. "aff. montana"*.

Occurrence: common. Flowers from November to December; predominantly self-pollinating; the upright flower with its rather prominent stigma readily "catches" pollen falling from the anther.

Historical note: Dan Hatch (1949) from specimens collected by Cedric Smith from Halfmoon Bay on Stewart Island: "Endemic -- not uncommon about the *Nothofagus* forests on Mount Ruapehu; Lake Manapouri; abundant throughout Stewart Island." Thomas Kirk had seen this plant on Stewart Island, and wrote in 1884 "The dwarf variety of *Pterostylis banksii*, with abbreviated sepals, is common in open places in the forest."

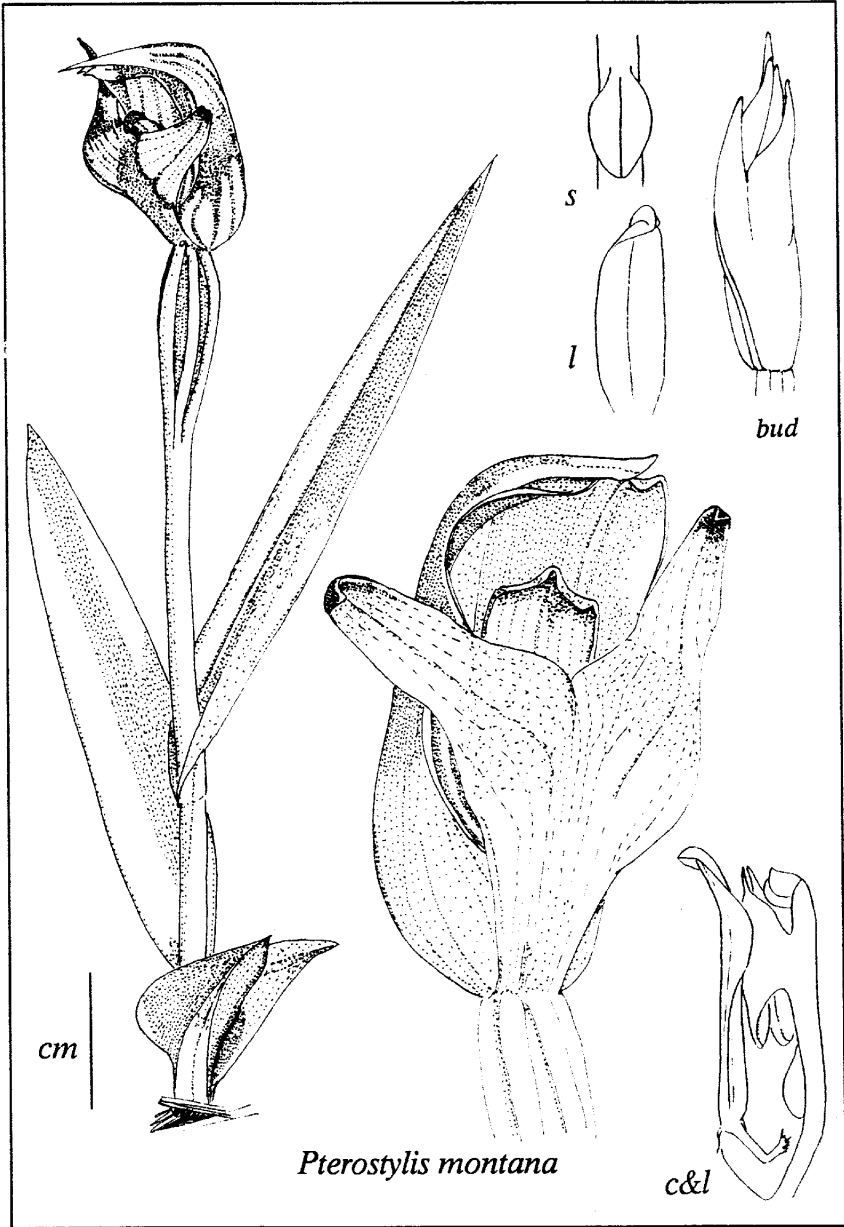
Pterostylis "aff. montana"

This is a very common grassland plant from around Dunedin, especially the Silverpeaks area, but there may be more than one species included.

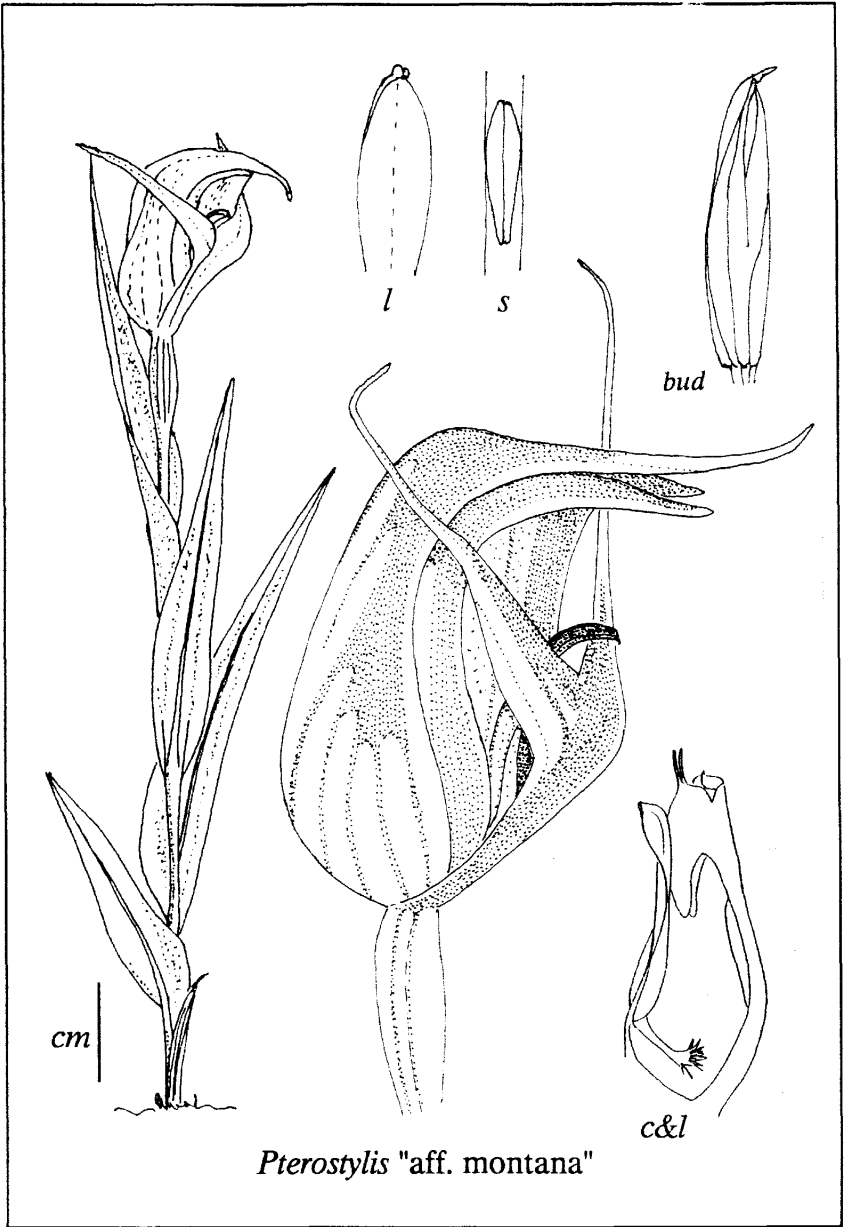
It is yellow-green overall, some plants with more spreading, arched leaves than *P. montana*, the flower more slender with elongated dorsal sepal and petals, and lateral sepals tail-like and overtopping the rest of the flower. The labellum is oval, the midrib less prominent. The stigma is long and oval, and does not overlap the column at its sides. A similar plant from the Catlins forests has been dubbed *P. "Catlins"* (see Key, p76).

Occurrence: *P. "aff. montana"* is very common. It flowers from October to December, and is predominantly insect pollinated: a large upward-pointing rostellum keeps the pollinia separate from the rather flat stigma

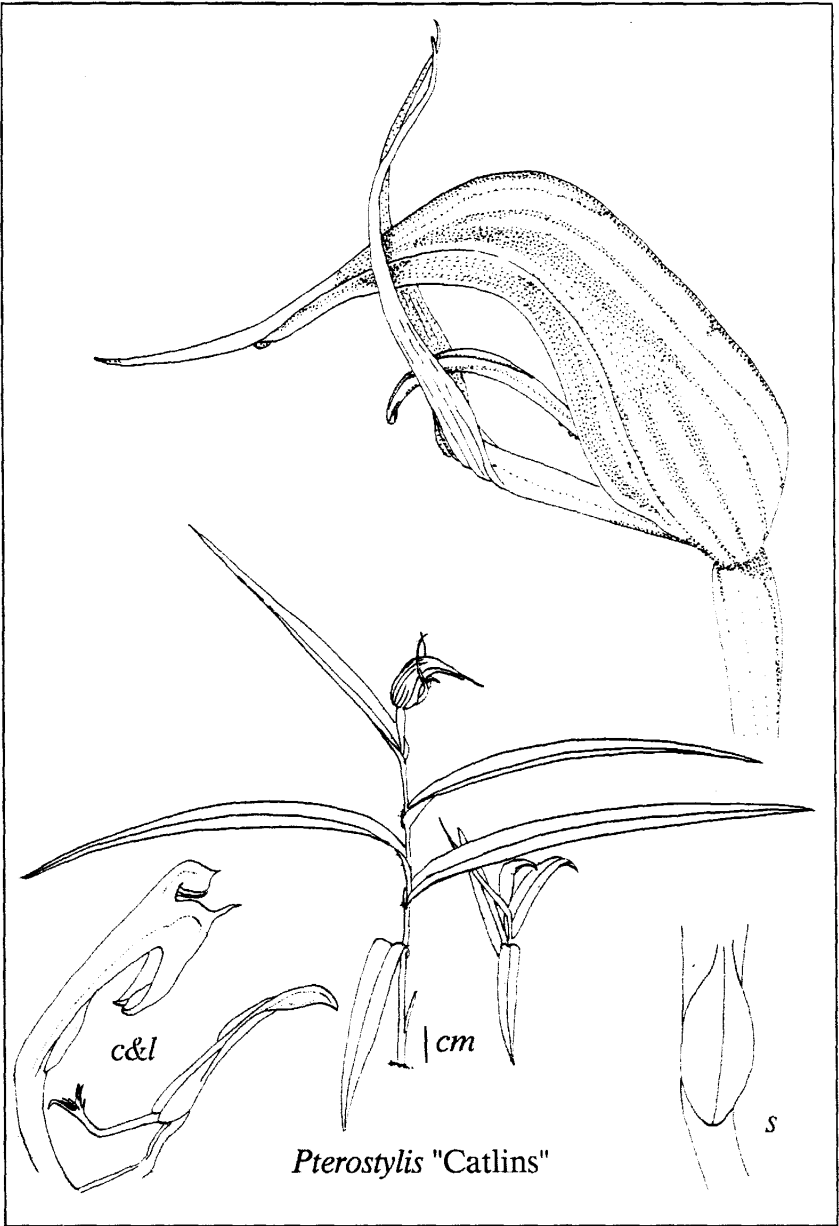
Historical note: Helen Dalrymple wrote (1937) "For fine fat specimens of *Pterostylis* you could search the lower slopes of Flagstaff or wander up the alluring tracks of Trotter's Gorge." This was *P. "aff. montana"*.



Pterostylis montana



Pterostylis "aff. montana"



Pterostylis "Catlins"

Pterostylis tristis Colenso

This is the species once thought to be the Australian *P. mutica*. So similar to *P. "aff. cycnocephala"*, that it was often confused with it in the past, but reliably reported, and drawn in flower in December 1968 from Sandymount on the Otago Peninsula by Bruce Irwin, who recorded twelve plants, one of which carried nine flowers.

In contrast to *P. "aff. cycnocephala"*, the plant is often brownish, the labellum appendage has no forward-projecting knob, and it flowers earlier.

Occurrence: open grassland; difficult to find, it flowers in the north from October to January, and is said to be predominantly self-pollinating.

Historical note: the Dunedin Naturalists' Field Club noted in 1882, in the short-lived *Journal of Science*, ". . . the rare *Pterostylis aphylla*, Lindley, found by Mr. S. Fulton near Outram." Cheeseman realised their mistake, identified the plant as *P. mutica* (since recognised as Colenso's *P. tristis* by Brian Molloy). The second edition of Martin's *Native plants of Dunedin and environs* (1962) reported "*P. mutica*" from Sandymount, Mihiwaka and Evansdale.

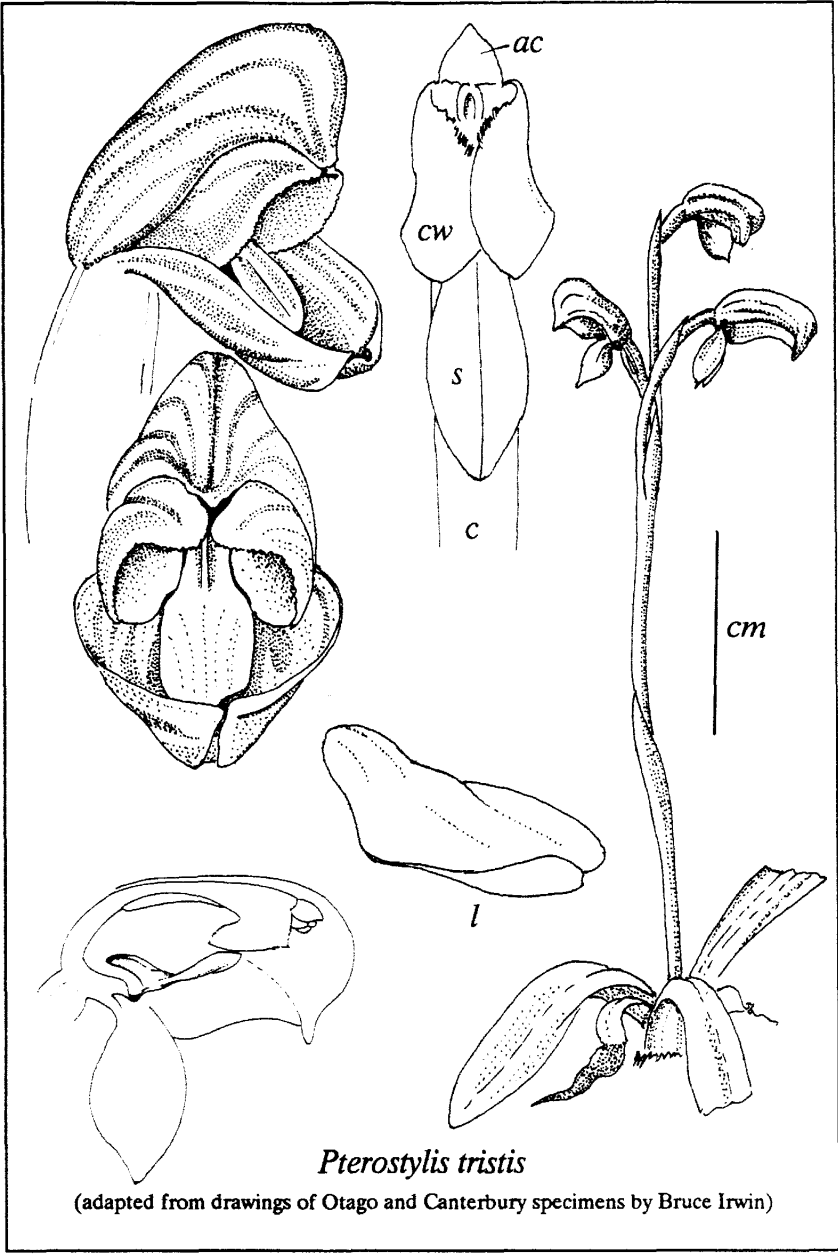
Pterostylis venosa Colenso

P. venosa is a small greenhood, a plant of less than 10cm height, the leaves oval, broad, membranous, veined and partly hiding the stem.

The single flower is on a short stalk, often overtopped by the leaves: 1.5cm tall, the dorsal sepal and petals short and blunt, the lateral sepals short and barely overtopping the flower. The labellum is narrow and triangular, arched and protruding, its inner surface in northern plants said to be covered with short downward-pointing hairs, though I have never seen them on southern plants. On a wet south-facing slope at the top of Berwick Forest under *Dracophyllum* and flax; on the track from the Dunedin motorway to Swampy in a similar habitat; in tussock by the old miners' track from Sunshine Bay to Moke Lake; in the Catlins.

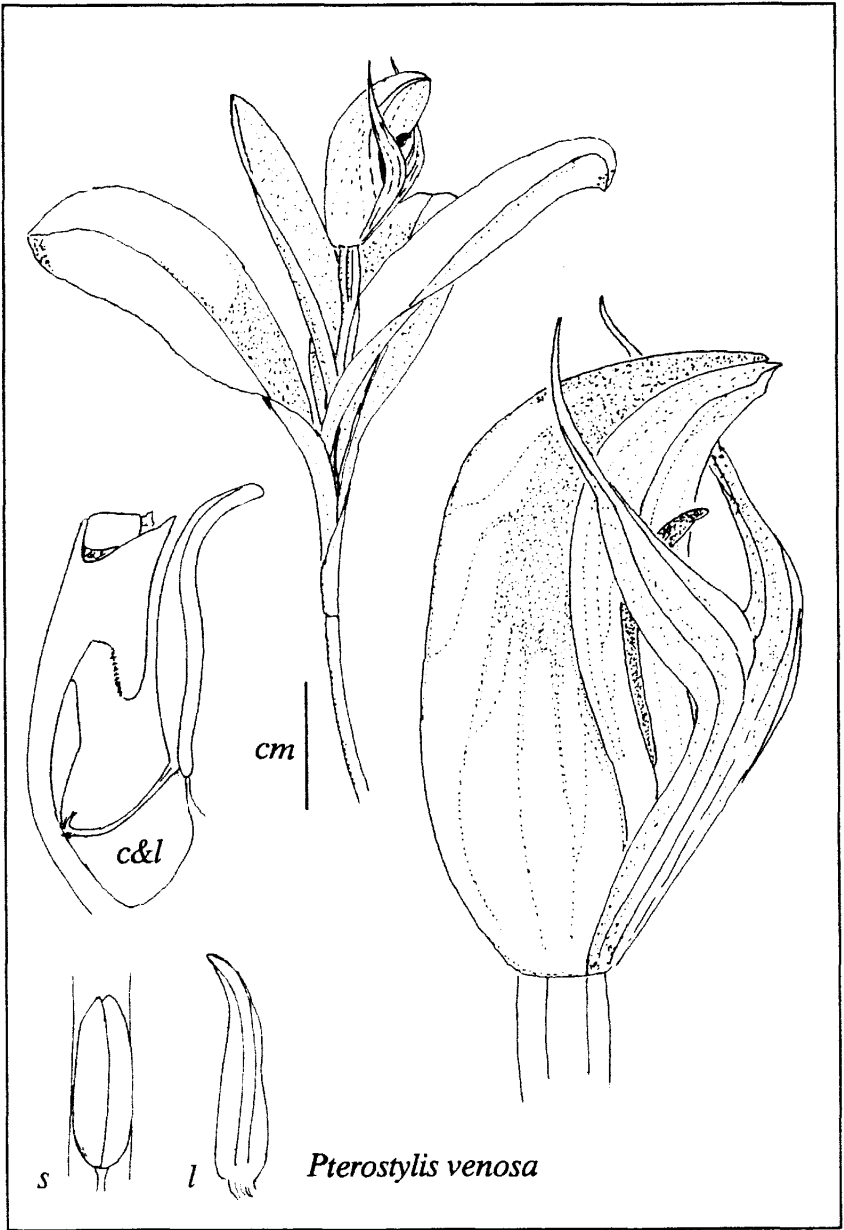
Occurrence: fairly common; it flowers in November or earlier, and is predominantly self-pollinating.

Historical note: Colenso wrote (1896): "I have only received two specimens of this little plant . . . unfortunately, though whole and perfect, they have been pressed very much in drying, so that it has been a difficult matter to ascertain correctly their finer internal construction, on which so much depends, and I have only dissected one of them."



Pterostylis tristis

(adapted from drawings of Otago and Canterbury specimens by Bruce Irwin)



Pterostylis venosa

Key to the southern species of Pterostylis

(adapted from Moore)

Usually single flower; labellum appendage brushlike

1. Lowest leaves usually different shape from uppermost leaves or bracts, sometimes forming more or less flat rosette; lower leaves more or less egg-shaped to narrow-elliptic with blade merging into shorter winged or indistinct leaf-stalk
 - (a) Labellum narrow-triangular, broadest at or very near base, mostly taller than column.....*P. foliata*
 - (b) Labellum elliptic to oblong, little if at all taller than column.....*P. areolata, P. australis*

2. Lowest leaves not different in shape from, though often smaller than those above, not forming flat rosette
 - (a) Leaves elliptic, usually forming close tuft surrounding flower.....*P. venosa*
 - (b) Leaves very narrow, lance-shaped, usually strongly keeled and grasslike; labellum base without prominent median callus
 - (i) Lateral sepals tail-like; stigma long, narrow flat. *P. banksii, P. graminea, P. "aff. montana"*
 - (ii) Lateral sepals tail-like; stigma somewhat rounded.....*P. "Catlins"*
 - (iii) Lateral sepals flat, rarely tail-like; stigma short, broad, prominent.....*P. montana*

Usually several flowers together; labellum oblong, lacking brushlike appendage.

1. Labellum with forward-pointing knob.....*P. "aff. cycnocephala"*
2. Labellum lacking forward-pointing knob.....*P. tristis*

Spiranthes L.C. Richard, 1817

Spiranthes is currently thought to have only one species in Australasia, though an apparently different plant tagged *S. "Motutangi"* may be a distinct North Island species. It is a worldwide genus of several hundred species.

Spiranthes sinensis (Persoon) Ames

Though it can grow to a metre tall, southern specimens of the "ladies' tresses" orchid are seldom more than 30cm; they are evergreen ground orchids with a cluster of swollen rhizomes.

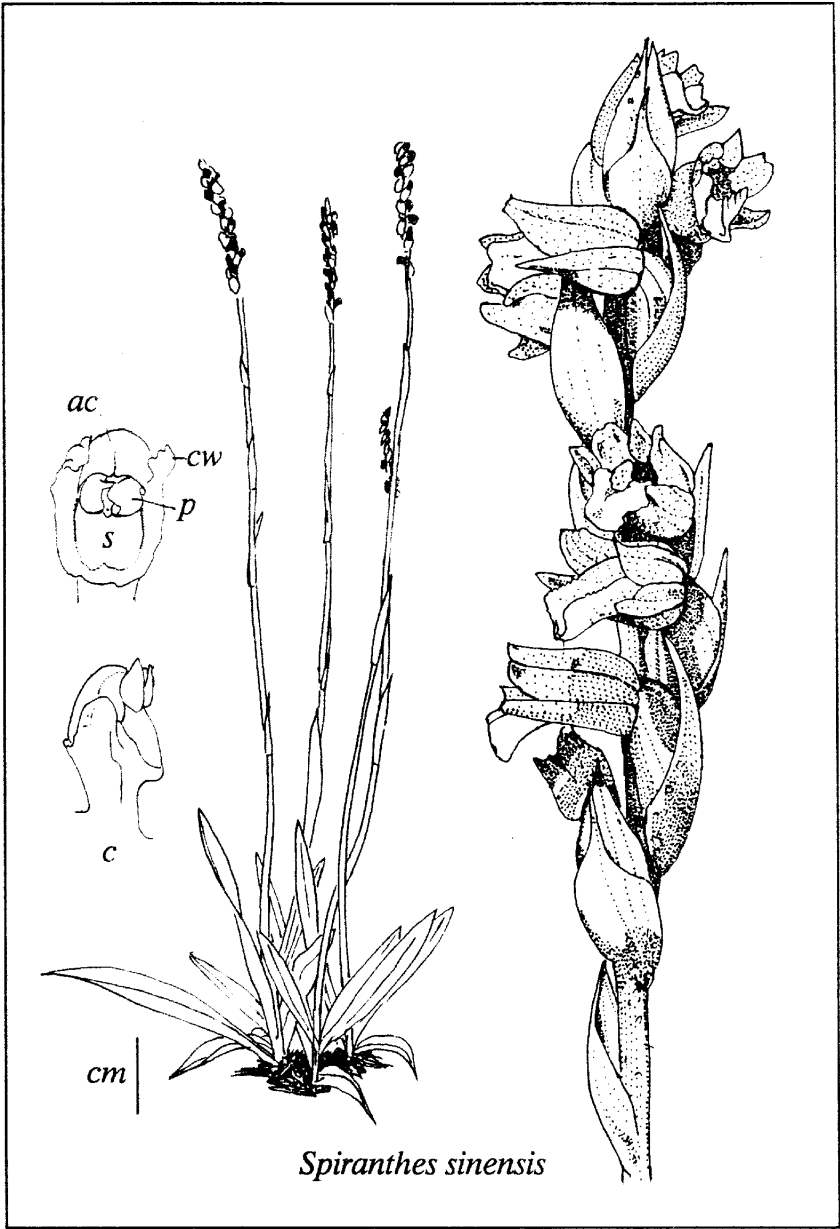
The stem is erect, much longer than the leaves, and bears many 0.5cm flowers, more or less spirally arranged up the stem. The flower parts are arranged in a cylinder, usually dark pink except for the white labellum, though entirely white forms occur in the north. The labellum is broad, and turned down at its fringed tip. The column is narrow, the stigma broad and prominent below the anther. There are half a dozen basal leaves, 5-10cm long by a centimetre wide, with a few bracts up the stem.

Peter Johnson found *Spiranthes* in a mire of soft peat, between forested old beach ridges, at Big Bay, Otago's northwesternmost point. I have seen it only in south Canterbury, near the road bridge over the Rangitata River. Northern forms are said to open much more widely than southern.

Occurrence: rare here, it flowers in Canterbury in January. Predominantly self-pollinating: the rostellum is almost invisible, and cannot keep the pollinia from contact with the subjacent stigma.

Cultivation: *S. sinensis* is evergreen in a greenhouse. Basic mix with one part shredded peat added. Not difficult if pots are stood permanently in a shallow saucer of water. Change water and clean saucer weekly. Responds to dilute liquid fertiliser. Thirty percent shade.

Historical note: this is the most international of our species, and its type locality is China. The modern Chinese orchidologist S.C. Chen wrote that it was called "ni", or "fragrant ribbon-grass". It is referred to in a puzzling excerpt from the 10th-6th century B.C. *Shih Ching*: "Saying that there is pottery on the road, and fragrant ribbon-grass on the mound, who had deceived my darling? I am worried, and on the alert." Colenso found it near Te Awamutu in 1842: "Leaving the swamp and entering the plain beyond it, I discovered a new elegant plant of the Orchideae family and genus *Microtis*, possessing a beautiful carmine-coloured perianth . . ." He sent it to Hooker who recognised it as *Spiranthes*.



Spiranthes sinensis

A genus of over fifty species, most of them Australian, these are the most colourful of our ground orchids. They open on dry days (hence the common name "sun orchids") and stay obstinately shut in damp weather.

They have single leaves, and stems bearing a raceme of many flowers. All have, at first glance, rather similar flowers and leaves. Sorting out the differences among the various species can be difficult; identification is usually made by comparing the structures of the columns.

The flowers are more regular in shape than those of other orchids, because the labellum and dorsal sepal are of much the same triangular form as the other petals and sepals. The column is short, its wings joined in front (at least partly hiding the anther) with various processes and decorations. The stigma is broad and flat. The single leaf is long and narrow, often quite fleshy, sheathing the stem at its base; smaller stem leaves appear further up. The tuber is oval.

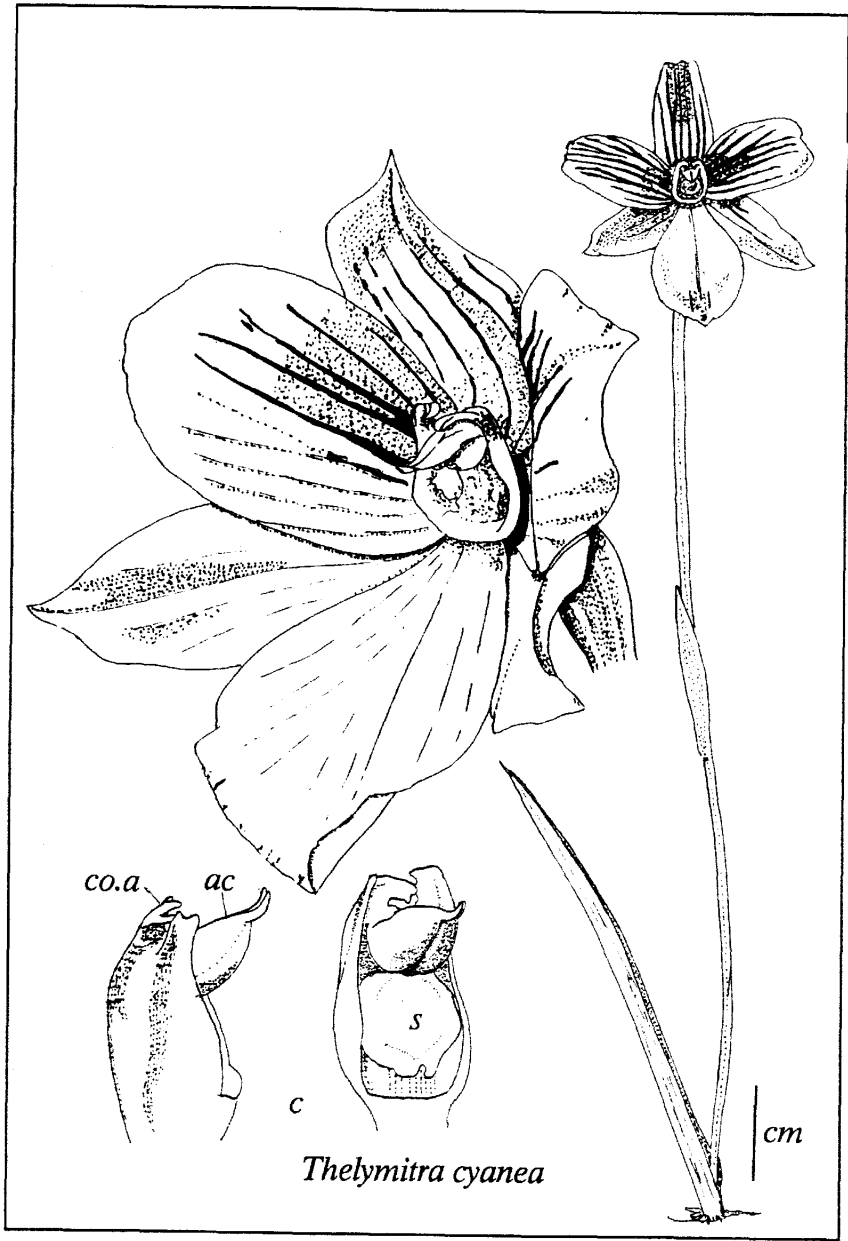
Cultivation: basic mix with one part extra coarse sand. The "sun orchids" like about 30% shade and most are reliable growers. Some wetland species (e.g. *T. cyanea*) require more frequent watering, but all need good drainage. Not all are colony-forming, single tuber replacement and seed dispersal maintaining the species. Those that do "clump" include *T. longifolia*, *T. pauciflora*, *T. pulchella*, *T. decora*, and *T. hatchii*. As a general rule, colony-forming species tolerate annual repotting but the others tend to resent disturbance.

Thelymitra cyanea (Lindley) Bentham

T. cyanea is the striped sun orchid.

It has a thin leaf, thickened at the edges and midrib to make a trefoil shape in cross section. The flower is 1-1.5cm long, usually dark blue, with thick, darker stripes on the petals and sometimes the sepals. The labellum more clearly different from the other petals and sepals than in other *Thelymitras*, larger and more folded, and the lateral sepals may be quite narrow. The column-arms are flat, yellow, twisting in a short corkscrew without hairs, their tips sometimes notched. There is no post-anther lobe, but clear calli lie behind the anther. The anther is almost fully exposed, and ends in short points.

There are a few clumps near the start of the Routeburn track, and it can be seen at Lake Wilkie, Maungatua, Silverpeaks, Lake Dispute near Queenstown, Shag Point, Waituna Lagoon, and Stewart Island.



Thelymitra cyanea

Occurrence: common in swamps and bogs, *T. cyanea* flowers from November to January and is predominantly self-pollinating.

Historical note: the first New Zealand description was by J.D. Hooker in the *Flora antarctica* in 1844, as *T. uniflora*, of a specimen found in the Auckland Islands. Hooker was "very uncertain as to the genus of this plant", and suspected that it was similar to the Australian species Lindley had called *Macdonaldia cyanea*. Afterwards the Robert Brown (1810) name of *T. venosa* was used for NZ plants, until the error was recently recognised, Hooker's suspicion confirmed, and the name *T. cyanea* applied.

Thelymitra decora Cheeseman

In 1986 I came across a lavender-blue, unspotted and unstriped *Thelymitra* that I had not seen before. It had white hairs on the column-arms, and the dark brown post-anther lobe was warty with dark tubercles. It matched plants that Brian Molloy had collected from Banks Peninsula.

It turned out to be *T. decora*; a few flowers in later seasons had a single spot on each petal. Before this the species was thought to extend only as far south as Nelson and Marlborough. Northern forms have flowers that are more intensely spotted, have fewer tubercles on the post-anther lobe, and open more fully.

It is a 30cm plant with up to six flowers of 1.5cm diameter. The many white hairs on the column arms extend above the post-anther lobe of the column, which is darkly tuberculate and has a yellow toothed rim. The leaf is thin, channelled and keeled.

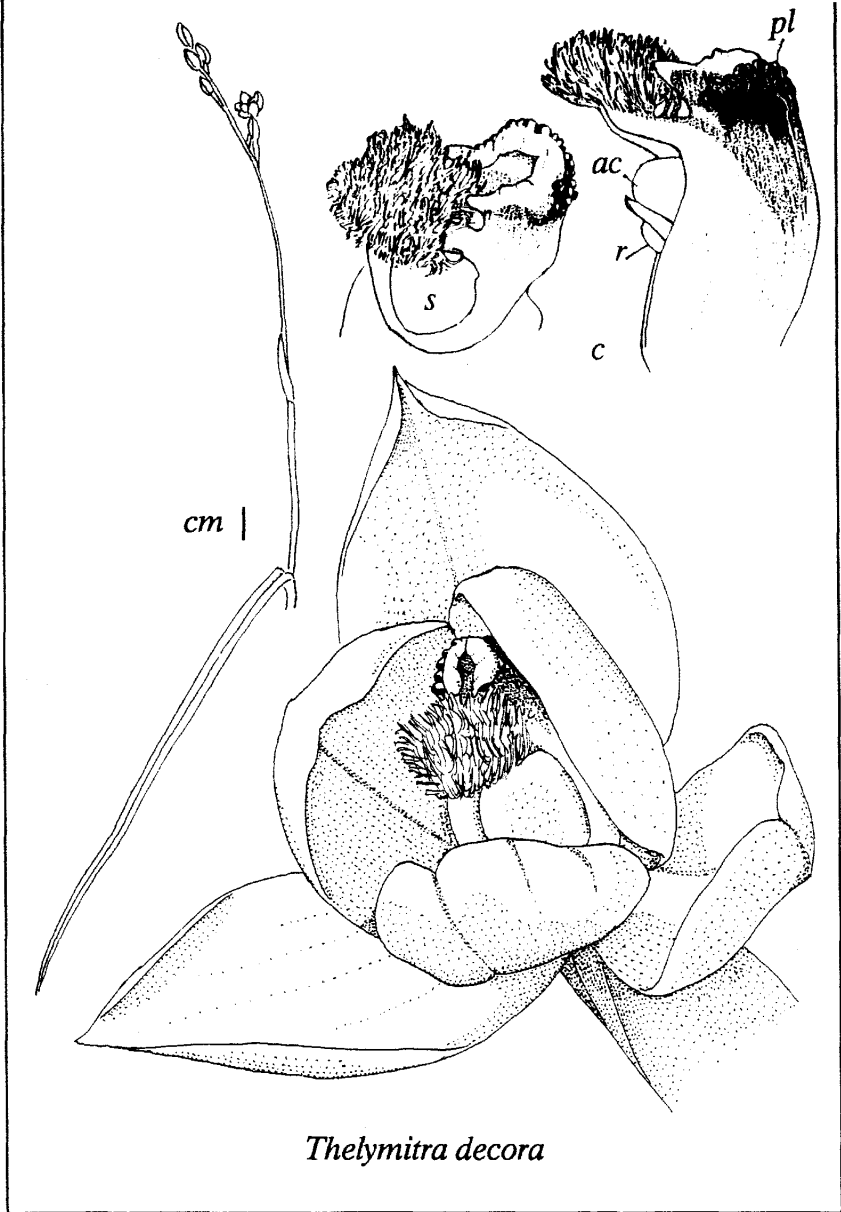
I have seen it only at Shag Point, on dry clay banks under manuka, though Bruce Irwin recorded *T. decora* from near Middlemarch some years ago.

Occurrence: rare in our region, flowering in November and December, predominantly self-pollinating.

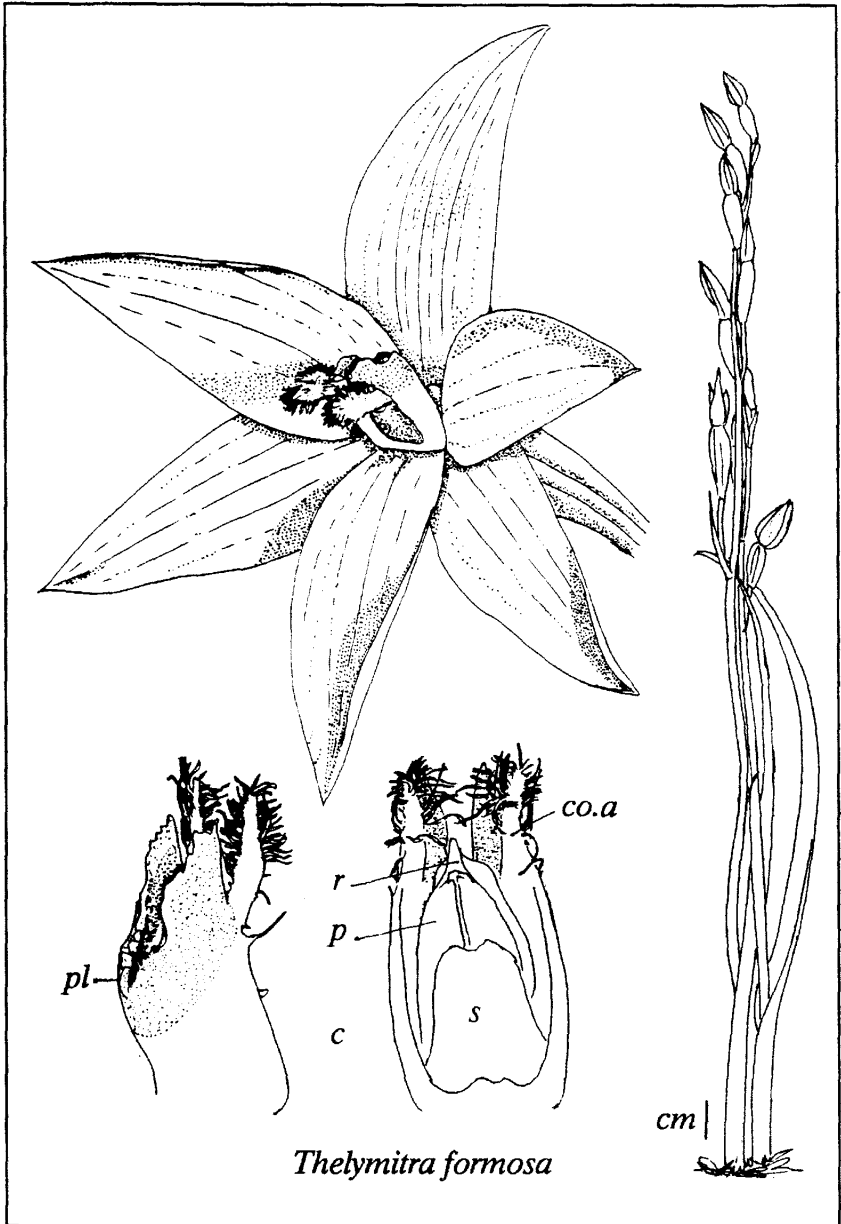
Historical note: Cheeseman first described this species from near Taupo in the Appendix to his *Manual* (1906).

Thelymitra formosa Colenso

A tall, very robust plant of 30cm or so, with a wide, thick and heavy leaf more or less erect, sheathing the stem for perhaps half its height.



Thelymitra decora



Thelymitra formosa

Up to eighteen flowers, each 1.5cm across, rarely opening, the petals and sepals all similarly shaped, blue and lacking stripes or spots. The column arms are flattened, emerge from the inner surfaces of the sides of the column, and bear rather coarse yellow hairs from their edges. The post-anther lobe is red and thickened into long calli. There are side-lobules, taller than the anther, with toothed margins.

I have seen *T. formosa* only since 1988 in the Lake Dispute area near Queenstown, half a dozen plants; and a colony of fifty near Dunedin's northern motorway: on dry clay banks, or under short manuka scrub. Manfred Peterek, a German visitor, found it in the Routeburn Track-Key Summit area in 1990, its most southern record.

Occurrence: rare in our region, it flowered in December and is clearly predominantly self-pollinating.

Historical note: Colenso found *T. formosa* in 1882, "In clayey ground, *Fagus* woods, high land between Norsewood and Dannevirke, Waipawa County; flowering in December."

Thelymitra hatchii L.B. Moore

Another robust *Thelymitra*, up to 40cm tall, the leaf wide and strap-like.

The flower is larger than most, 2cm across, the blue-purple petals and sepals often yellow-edged and pointed, lacking stripes or spots. The column-arms are round in cross-section, and bear tufts of many pale yellow hairs, standing erect above the tall post-anther lobe, which appears to be cut squarely across, red with a yellow edge, toothed and pointed.

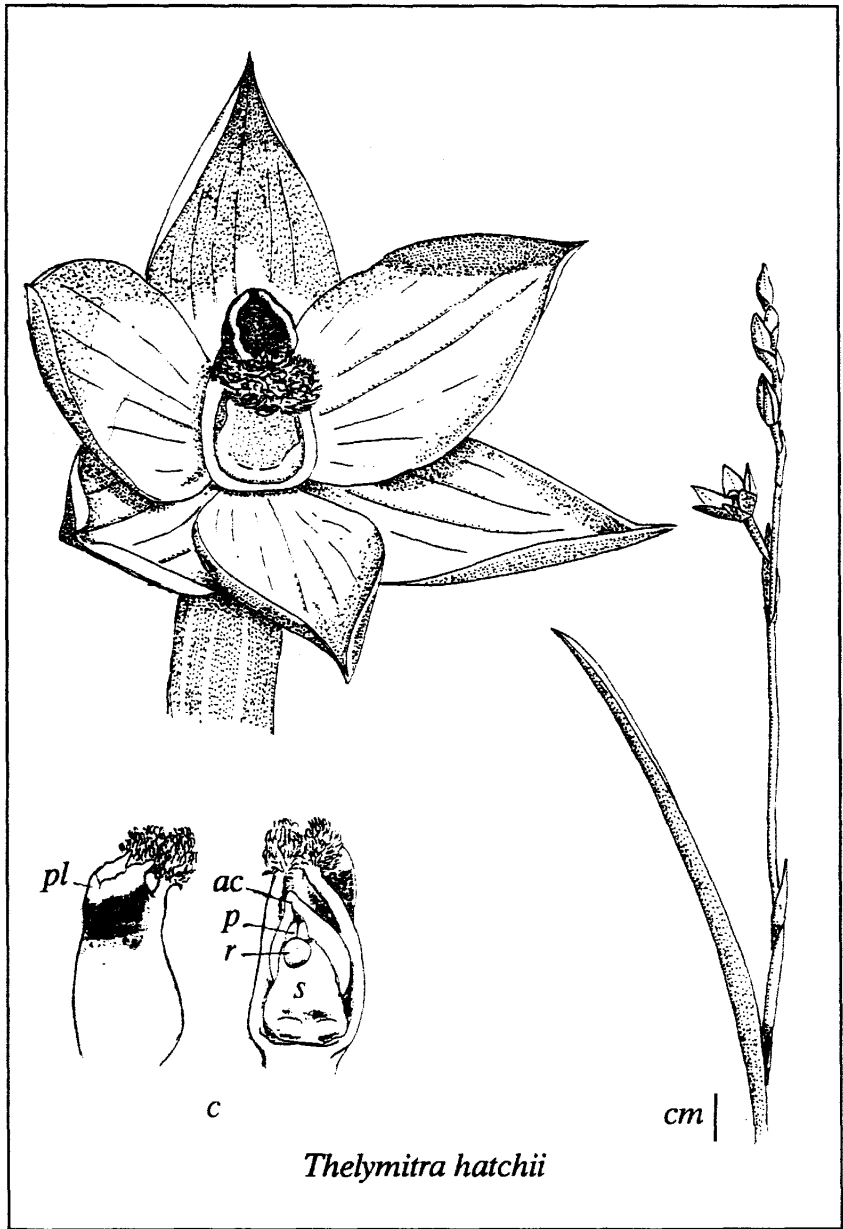
Lake Dispute, Silverpeaks, Longwoods, Stewart Island. Mostly on dry clay banks, in gravel or under short scrub with plenty of light.

Occurrence: fairly common. Flowers from November to January. Predominantly self-pollinating.

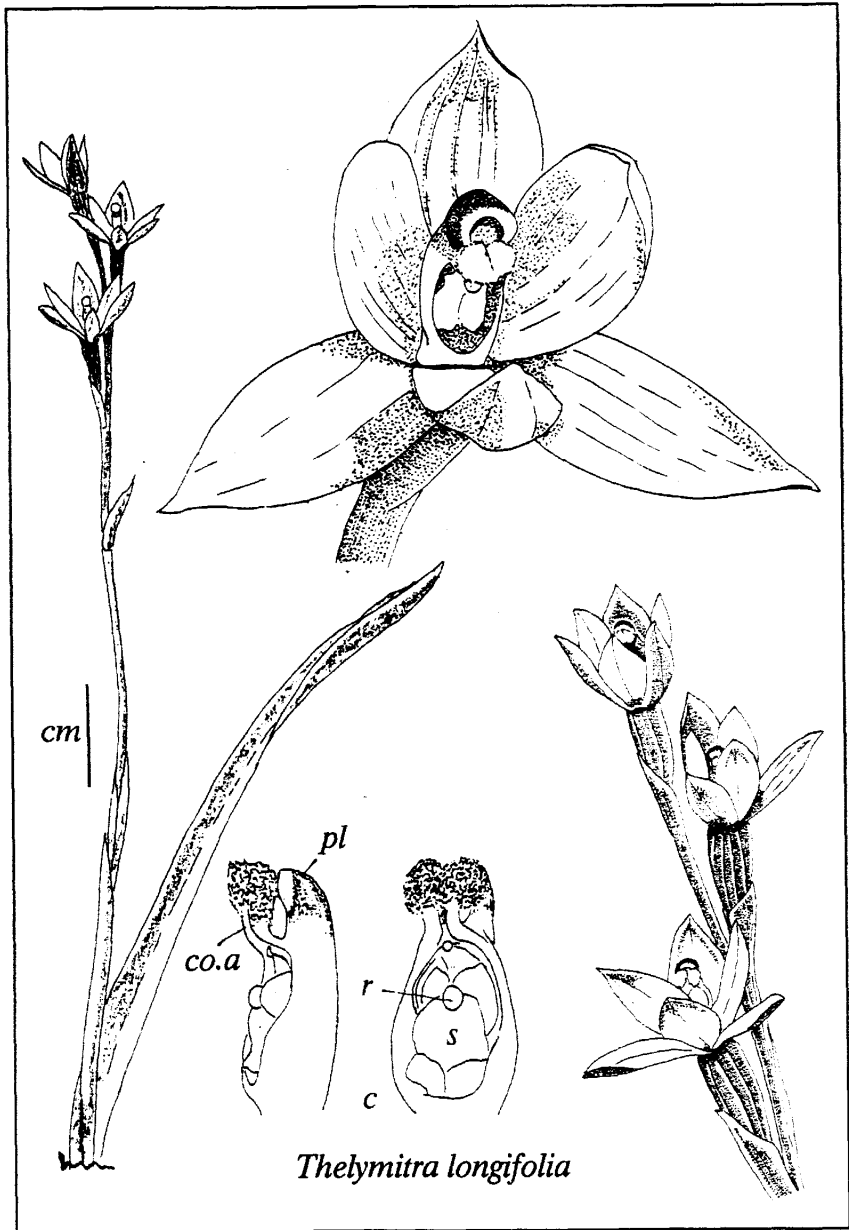
Historical note: Lucy Moore named this species in 1968 in honour of E.D. Hatch "who reviewed and illustrated the orchids of New Zealand in a comprehensive series of papers from 1945 to 1952, and has since continued to grow and study these plants."

Thelymitra longifolia J.R. and J.G.A.Forster

The common sun orchid, *T. longifolia*, grows on clay banks and in grassland, and under scrub.



Thelymitra hatchii



Thelymitra longifolia

The leaf is wide, strap-shaped and long, not as stiff as that of many *Thelymitras*. The plant can be quite variable in shape and size, the flowers white or tinged pinkish, grey-green backed. Up to twenty buds may form; the flowers can be 1.5cm across, lacking spots or stripes. The column-arms are round in cross-section, bent forward, each carrying a cottonwool tuft of white hairs lying under the post-anther lobe, which is dark brown and smooth, with a yellow semicircular unnotched or shallowly notched margin.

It can be pollinated by insects, but can also self-pollinate. This means that in a dry season one may see the flowers, open to the sun. But in a wet summer the flowers may never open. I have watched plants at Sunshine Bay in Queenstown, week after week, waiting for the flowers, only to find that fruit had formed under the buds without a flower ever having appeared.

Occurrence: very common. Flowers from November to January. Predominantly self-pollinating.

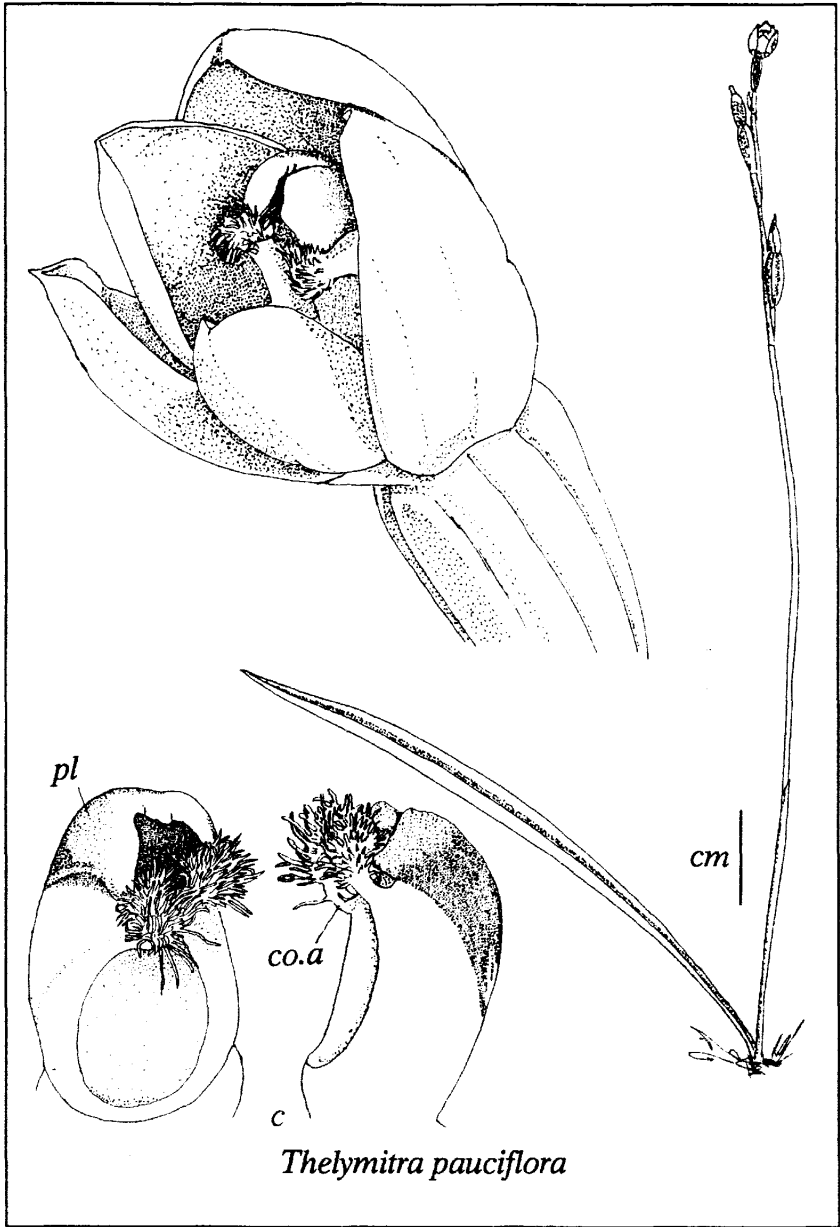
Historical note: J.R. Forster noted in his diary in November 1773, after an outing to Long Island, Queen Charlotte Sound, "We returned to dinner, having found . . . another new plant nearly relating to the class of Orches, but of a very singular structure & making absolutely a new genus." It had been found by Banks and Solander during Cook's first voyage, and called *Serapias regularis*. The Forsters named it *Thelymitra*.

Thelymitra pauciflora R. Brown

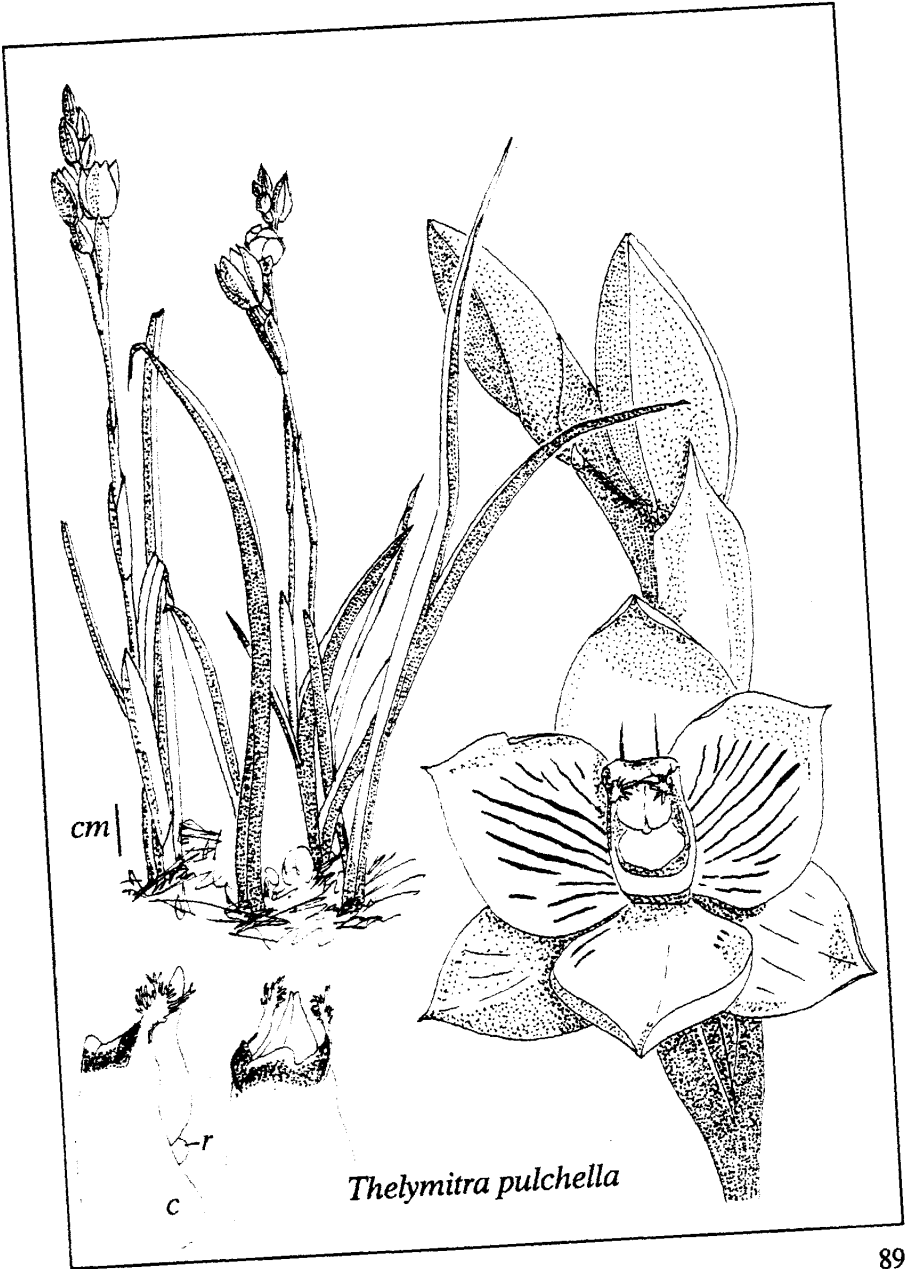
T. pauciflora is similar to *T. longifolia*, though a cleft in its column identifies it: there seem to be intermediate forms, at least in the north, making clear differentiation difficult. It is a predominantly reddish stemmed plant, the leaf wide, channelled and fleshy, with red tints, the flower slender, light mauve-blue, with no stripes or spots, a centimetre or so in diameter, the similarly shaped petals and sepals barely opening. The column arms are round in cross-section, more or less erect, bearing rather sparse white hairs, the post-anther lobe dark, with a deep cleft whose edges are yellow and turned in.

Reported recently in the south by Mark Hanger, who found it in the Wilderness Reserve near Manapouri (bog pine woodland) and on the Blue Mountains.

Occurrence: I have seen it in the Lake Dispute area near Queenstown, at Shag Point, and in the Silverpeaks area: rare in our region, very common elsewhere, it flowers in November here. Predominantly self-pollinating.



Thelymitra pauciflora



Historical note: Lucy Moore noted in 1970 the difficulty in naming the plant, and wrote, "The name *pauciflora* is used here (*Flora of New Zealand*, Volume II) for plants in which the two sides of the narrow cleft are smoothly incurved so that their margins are usually not visible; correlated characters seem to be exceptionally stiff white cilia, early flowering, the flowers apparently able to set seed without the perianth having opened, and marked general reddish colouring of the whole plant in exposed places."

Thelymitra pulchella J.D. Hooker

T. pulchella ("beautiful") is easily found; there are usually clumps of several plants together, the pink or blue flowers bright stars in open grassland.

It is a thick-stemmed robust plant with a wide, keeled leaf. There are up to half a dozen flowers on the stem, few open at a time, and each 1.5cm across, blue or pink, often decorated with darker stripes on the petals and sepals. The column-arms are flat and reddish, bearing coarse seaweed-like red-orange-yellow fringes. The post-anther lobe is variable, sometimes thickened, tuberculate, reddish and edged with yellow.

Bob's Cove (Lake Wakatipu), the Catlins roadsides, Manapouri, Silverpeaks (less common as the pine forests grow and shade the ground), Mount Cargill and Flagstaff; in many open places about Dunedin.

Occurrence: common. Flowering from November to January. Predominantly self-pollinating.

Historical note: Cheeseman wrote in his 1906 *Manual*: "A well-marked species, distinguished by the large purple-blue flowers I have seen no South Island specimens, and suspect that Monro's and Lyall's plants, mentioned by Hooker in the *Handbook*, are nothing more than large states of *T. uniflora*" (*cyanea*). He was mistaken.

So, until recently, were the Australians, who realised only in 1989 that *Thelymitra pulchella* is also found there. *The Orchadian* [1991, 10 (3, Autumn): 83-4] contains an account of its recently recognised occurrence in Victoria: ". . . there appear to be two distinct forms of this orchid, one from subalpine meadows of the eastern highlands, and the other from lowland swamps and grasstree plains, mainly in East Gippsland The former have intense blue or purple flowers with prominent darker veins, while the latter are uniformly pale blue in colour. Morphologically they are very similar with some variation in the amount of toothing or lobing on the column arms, a feature also displayed by this species in New Zealand. In Tasmania, the two forms are sometimes found growing together and flowering at the same time. In Victoria, the sub-alpine plants flower mainly from late December

through January, whilst those from the lowlands flower from October to November. The pale blue lowland form has been identified as an undescribed species based on collections from the Croajingalong National Park. The highland form in recent years was thought to be a natural hybrid. *T. pulchella* appears to be quite rare in Victoria, but fortunately both forms occur within national parks and are probably secure at present. Over-grazing, draining of swamps and weed invasion may constitute some future threats to this most attractive Sun Orchid."

Key to the southern species of Thelymitra

Thelymitra flowers cannot be distinguished reliably by their colour, but examination of the columns, and especially the decorations (hairs, or fringes) of the column-arms, can be used as a rough guide.

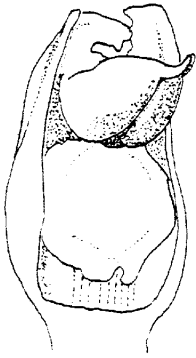
Column-arms

- Lacking hairs, ribbon-like.....*T. cyanea*
- With plentiful fine hairs.....1
- With coarse fringes.....3

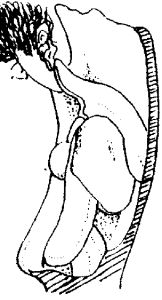
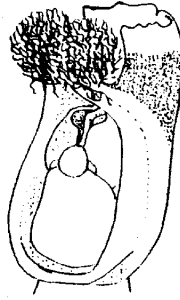
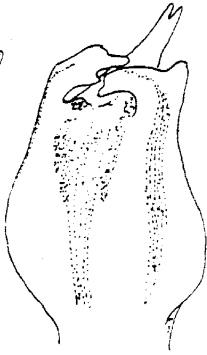
- 1. Pale yellow hairs.....*T. hatchii*
- White hairs.....2

- 2. Tuberculate post-anther lobe, petals rounded.....*T. decora*
- Sparse hairs, deeply cleft post-anther lobe, fls pink to blue..
-*T. pauciflora*
- Cottonwool hairs, post-anther lobe broad and undivided, fls
- white or occas. pink.....*T. longifolia*

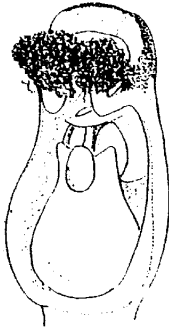
- 3. Coarse yellow/orange fimbria, petals not striped, side lobules
- of column fleshy and toothed; column-arm projecting from
- inner face of side-lobule.....*T. formosa*
- Coarse yellow/orange "seaweed-like" fimbriae, petals striped,
- side-lobules absent.....*T. pulchella*



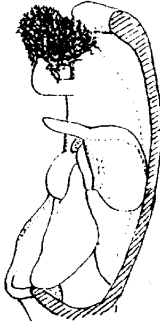
T. cyanea



T. hatchii



T. longifolia



T. pauciflora



T. formosa



T. decora



T. pulchella

Columns of the southern species of *Thelymitra*

Pollination of the southern orchids

The detail of what follows is taken from Brian Molloy's chapter in the New Zealand Native Orchid Group's book *The New Zealand native orchids: natural history and cultivation*, 1990.

With few exceptions, if pollination is to take place, the pollen from the male anther must come into contact with the female stigma.

As with other flowers, insects may help in this: insect pollination is called entomophily. Perhaps 97 percent of the world's orchid species are entomophilous.

But in New Zealand the position appears to be quite different. Many of our orchids are predominantly self-pollinating (autogamous), and here in the south 60 percent show autogamy, to some extent perhaps because of a paucity of pollinating insects here.

Apart from the field commentaries of G.M. Thomson around the turn of the century, few observations on the pollination of southern species have been carried out, but characteristics that suggest predominant self-pollination include

- buds that do not open;
- small, few flowers, that
- barely or only briefly open,
- do not produce nectar or scent,
- are non-resupinate (labellum uppermost) or lack a conspicuous labellum,
- have noncoherent mealy pollen that falls easily onto the stigma,
- have the pollen-bearing anther close to the stigma,
- lack a prominent rostellum separating anther and stigma,
- show a floral stance (vertical in *Pterostylis*) with a column disposed to allow pollen falling from above easy access to the stigma,
- have a prominent stigma that easily catches falling pollen, and
- produce plentiful seed as a result;

because of the inbreeding that self-pollination implies, individuals in a geographical region tend to show little intra-specific variation.

Conversely, characteristics that suggest insect pollination include large colourful flowers that open wide and long, produce nectar or scent; have a large, colourful (or irritable in *Pterostylis*) labellum as a landing platform for insects, adherent masses of pollen (pollinia), wide separation of the anther and stigma, a prominent rostellum forming a barrier between them, a floral stance (with the column leaning forward in the case of *Pterostylis*) that would cause falling pollen to miss the stigma, and a stigma that is flat and narrow. They may produce scant seed. Because of cross-pollination individuals in a

geographical region may show variation within a species to an extent that they may be regarded as different species. These characteristics do not necessarily prove insect-pollination, but may simply indicate the persistence of ancestral features that have evolved elsewhere.

Self-pollination may be a fall-back position adopted by species that are normally insect-pollinated, but have been disappointed this season.

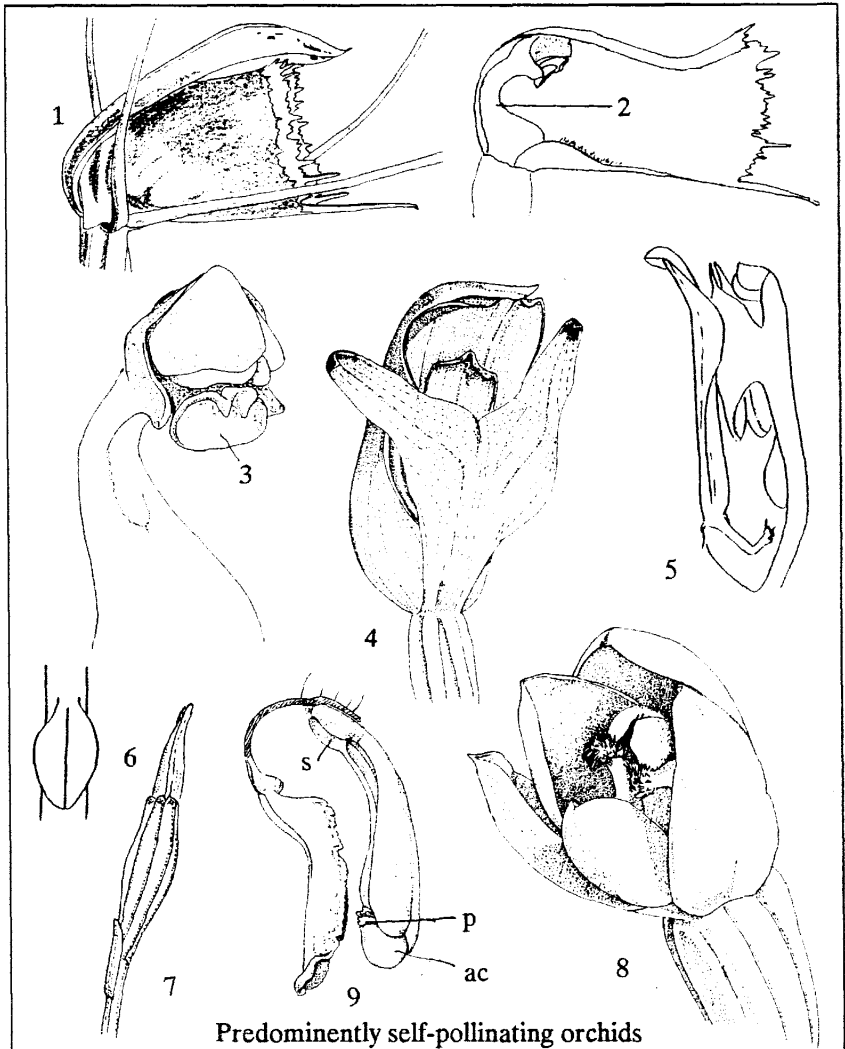
The Tables list southern orchids by pollination systems. All the southern species of *Thelymitra* appear to be self-pollinating. The epiphytes, most species of *Corybas* and half the southern species of *Pterostylis* are among those that appear to be insect-pollinated.

Predominantly insect-pollinated species

Acianthus sinclairii
Aporostylis bifolia
Caladenia lyallii
Corybas acuminatus
Corybas macranthus
Corybas rivularis
Corybas trilobus
Corybas "short tepals"
Dendrobium cunninghamii
Drymoanthus adversus
Drymoanthus "spotted leaf"
Earina autumnalis
Earina mucronata
Pterostylis areolata
Pterostylis australis
Pterostylis banksii
Pterostylis graminea
Pterostylis "aff. montana"
Pterostylis "Catlins"

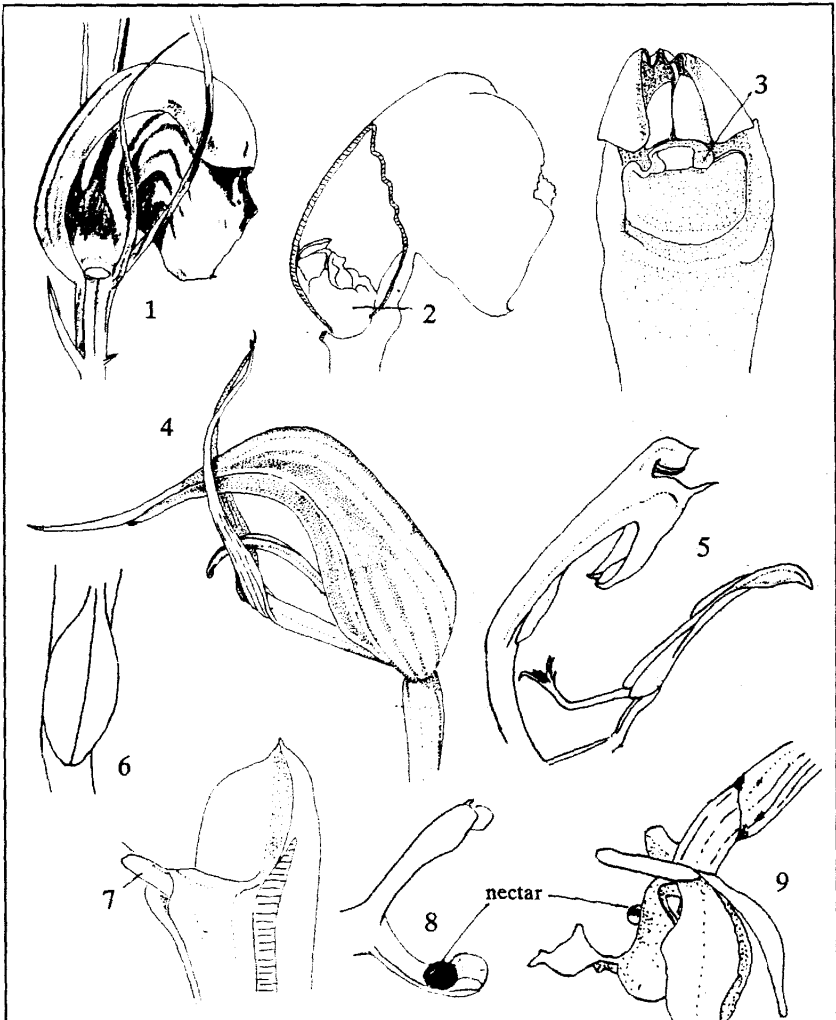
Predominantly self-pollinating species

Acianthus viridis
Adenochilus gracilis
Bulbophyllum pygmaeum
Caladenia catenata
Caladenia
Chiloglottis cornuta
Corybas cryptanthus
Corybas oblongus
Gastrodia cunninghamii
Gastrodia minor
Gastrodia "long column"
Lyperanthus antarcticus
Microtis oligantha
Microtis unifolia
Prasophyllum colensoi
Pterostylis foliata
Pterostylis montana
Pterostylis tristis
Pterostylis venosa
Pterostylis "aff. cycnocephala"
Spiranthes sinensis
Thelymitra cyanea
Thelymitra decora
Thelymitra formosa
Thelymitra hatchii
Thelymitra longifolia
Thelymitra pauciflora
Thelymitra pulchella



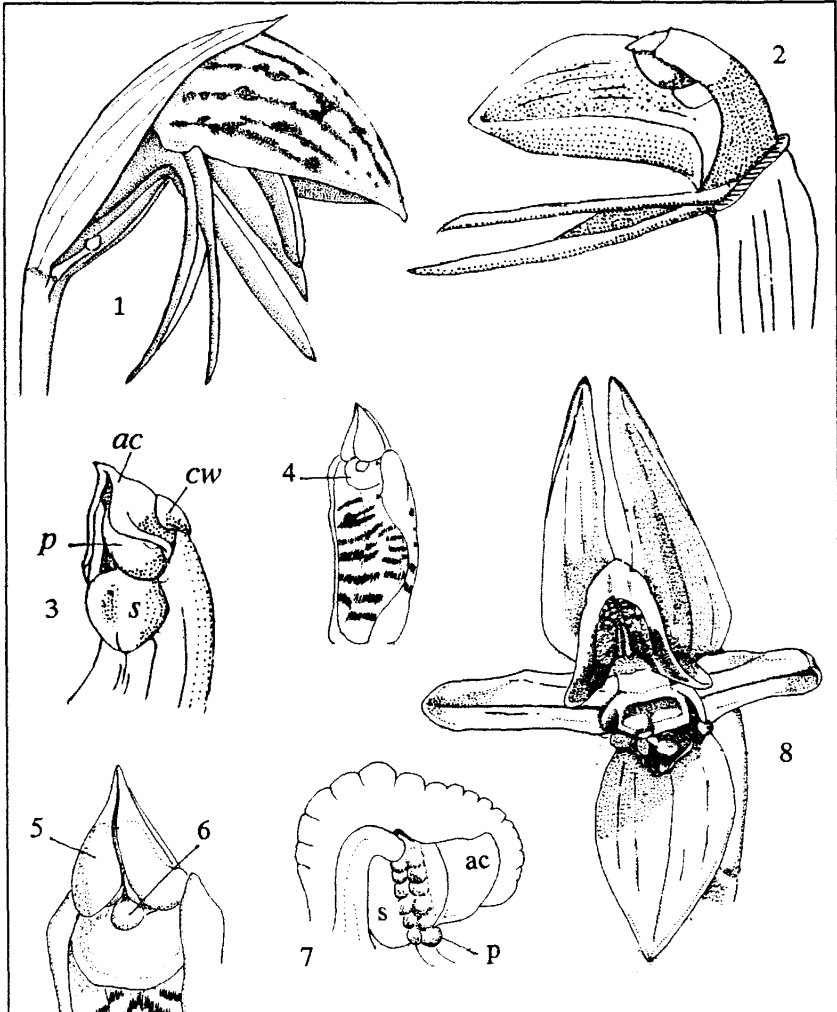
Predominantly self-pollinating orchids

The rather horizontal flower of *Corybas oblongus* (1) contains an elongated column (2) which arches over the stigma (3), allowing self-pollination. The upright flower of *Pterostylis montana* (4) with its upright column (5) allows pollen to fall easily onto the rather prominent stigma (6). The buds of *Thelymitra longifolia* (7) may fail to open in a wet summer. The flowers of *T. pauciflora* (8) barely open in the south. The stigma is well above the anther in the pendant flower of *Gastrodia* "long column" (9) but as the flower matures it tips upward to facilitate self-pollination.



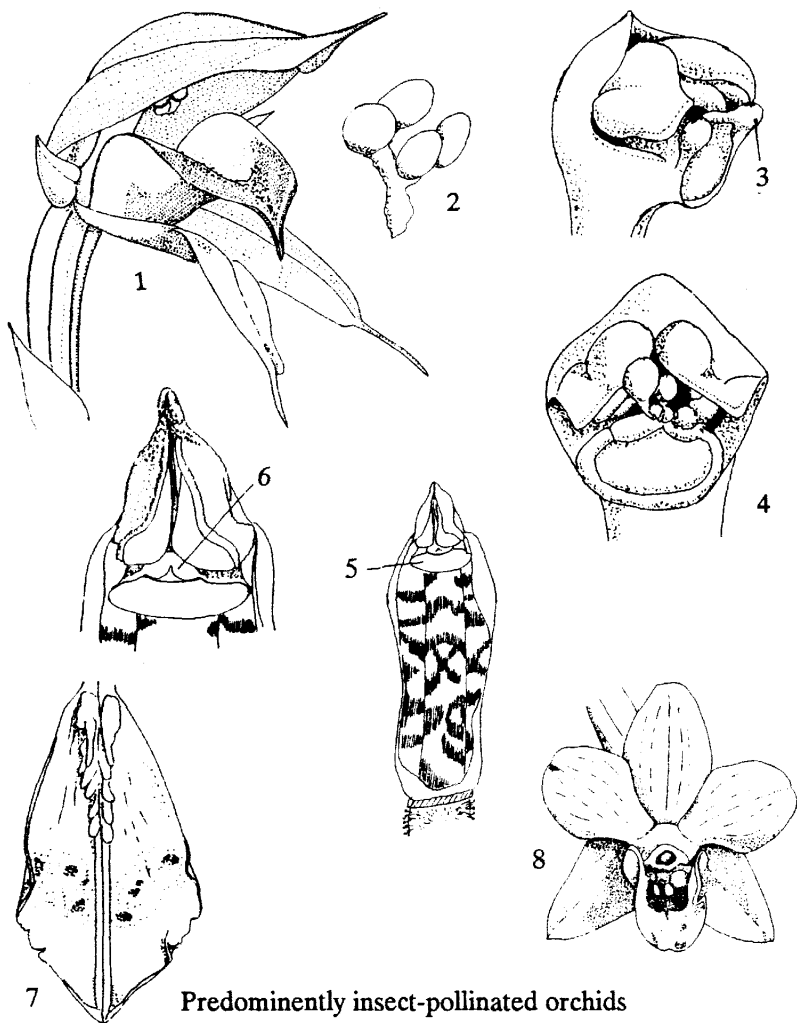
Predominantly insect-pollinated orchids

The upright flower of *Corybas trilobus* (1) contains a short horizontal column (2); pollen cannot easily contact the stigma. The prominent double rostellum (3) also acts as a barrier between anther and stigma. The flower of *P. "Catlins"* leans forward (4), as does its column (5); pollen cannot easily fall onto its rather flat stigma (6); a large rostellum (7) adds a further barrier. The column-foot of *Dendrobium cunninghamii* (8) exudes nectar, as does the labellum of *Earina mucronata* (9).



Predominantly self-pollinating orchids

The few, rather inconspicuous flowers of *Lyperanthus antarcticus* (1) never open widely, but contain an upright column (2) bearing pollen in close proximity to the prominent stigma (3). In *Caladenia catenata* the stigma is vertical (4), allowing easy access for the pollen from above (5). A small rostellum (6) provides little obstruction. The short curled column of *Gastrodia cunninghamii* (7) brings the mealy non-coherent pollen into direct contact with the stigma. The non-resupinate flower of *Prasopphyllum colensoi* (8) has its labellum uppermost.



Predominantly insect-pollinated orchids

The many-flowered *Acianthus sinclairii* (1) opens widely. Globular pollinia (2) are separated from the down-facing stigma by a prominent double rostellum (3): [in (4) the pollinia have come loose and are held off the stigma by the rostellum]. Similarly *Caladenia lyallii* has two important differences from its near relative *C. catenata* - the stigma is down-facing (5) and the prominent double rostellum (6) aids in preventing the pollinia from falling onto the stigma. The broad labellum of *Aporostylis bifolia* is decorated with pseudopollen (7) and the strong scent of *Earina autumnalis* (8) attracts insects.

Jul Aug S Oct N Dec J Feb M Apr M J

Earina autumnalis	xx						xxxx xxxx xxxx xxxx xxxx	L
Earina mucronata				xx xxxx xxx				L
Gastrodia cunninghamii					xxx xxx			LD
Gastrodia minor					xx			D
Gastrodia "long column"					xxx			
Lyperanthus antarcticus					xx xxxx xx			L
Microtis oligantha					x xxxx x			D
Microtis unifolia				x xxxx xxx				SLD
Prasophyllum colensoi				xxxx xxxx				SLD
Pterostylis areolata				xx xxxx				
Pterostylis australis				x xxxx				LD
Pterostylis banksii				x xxxx xxxx				LD
Pterostylis foliata				xx				S
Pterostylis graminea				xxx xx				
Pterostylis montana				xxx x				SL
Pterostylis tristis				oooo oooo oooo oooo				
Pterostylis venosa				xxx				D
Pterostylis "aff. cynocephala"					xxxx xx			
Pterostylis "aff. montana"				x xxxx xx				SLD
Pterostylis "Catlins"				xxxx				
Spiranthes sinensis						oooo		
Thelymitra cyanea				x xxxx xxxx				SLD
Thelymitra decora				x x				S
Thelymitra formosa					x			D
Thelymitra hatchii				x xxxx xxxx				SLD
Thelymitra longifolia				xxx xxxx x				SLD
Thelymitra pauciflora				xxx				SD
Thelymitra pulchella				xxx xxxx xxxx				SLD

Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun

What the names mean

The scientific names are double: the former is the name of the genus, the latter that of the species, i.e. they are the generic and specific names.

Acianthus: "pointed flower"
sinclairii: named for Dr Andrew Sinclair (1796-1861), naval surgeon and later Colonial Secretary

viridis: green
Adenochilus: "gland lip", for the decorations on the lip

gracilis: graceful
Aporostylis: "uncertain style", because for a long time nobody knew how to classify it

bifolia: two-leaved
Bulbophyllum: "bulb-leaf"

pygmaeum: small
Caladenia: "beautiful gland", for the ornamented lip

catenata: intertwined
minor: lesser

lyallii: named for Dr David Lyall (1817-1895), surgeon of the *Acheron*

Chiloglottis: "lip-throat", for the fancied resemblance to the equivalent human anatomy

cornuta: horned

Corybas: named for the Corybantes, priests of Phrygia who danced to honour the Goddess Rhea Cybele

acuminatus: pointed
cryptanthus: hidden-flowered

macranthus: large-flowered

oblongus: oblong

rivularis: growing in streams

trilobus: three-lobed (leaf)

"short tepals": lacking the usual long sepals and petals of the common N.Z. species of *Corybas*

Dendrobium: "tree-life", for the preferred habitat

cunninghamii: named for Allan Cunningham (1791-1839), early botanist in New Zealand

Drymoanthus: "forest flower"
adversus: opposite (leaf)
"spotted leaf": they are

Earina: "springtime", named for the first species described, *Earina mucronata*

autumnalis: autumn (flowering)

mucronata: spring (flowering)

Gastrodia: "like a stomach", for the shape of the flowers

cunninghamii: named for Allan Cunningham

minor: small

"long column": the column is long compared with the short columns of *G. cunninghamii* and *G. minor*

Lyperanthus: "dull flower"

antarcticus: southern

Microtis: "small ear", for the ear-shaped column-wings

oligantha: few-flowered

unifolia: single-leaved

Prasophyllum: "leek-leaf"

colensoi: named for William Colenso (1811-1899), missionary-printer-explorer-botanist-collector

Pterostylis: "winged style", for the winged column

areolata: divided into small areas

australis: southern

banksii: named for Sir Joseph Banks (1743-1820), the wealthy British patron of science who accompanied Cook on the first voyage

"aff. *cycnocephala*": having an affinity with *P. cycnocephala* (head like a swan)

foliata: leafy

graminea: grassy

montana: montane

"aff. *montana*": having an affinity with *P. montana*

tristis: sad (dingy-looking)

venosa: veined

Spiranthes: spiral-flowered

sinensis: from China

Thelymitra: "female headband", for the shape of the column in some species

cyanea: blue

decora: pretty

formosa: pretty

hatchii: named for Dan Hatch (1919-), contemporary N.Z. orchidologist

longifolia: long-leaved

pauciflora: poor-flowered

pulchella: beautiful

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Map of the southern South Island and Stewart Island

