

An appreciation of
NEW ZEALAND NATIVE ORCHIDS

on the Central Volcanic Plateau

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TAUPO GROUP

Taupo Orchid Society

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Native orchids are their own worst enemies. They are usually small secretive plants which tend to be over looked by all but the enthusiast. This booklet is dedicated to raising the general public awareness of native orchids and thus an appreciation of some of New Zealand's more unusual and beautiful plants.

Native orchids should not be dug up unless they are in danger of destruction through earth works, forestry operations, spray programmes and such like.

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Levin Native Flora Club

Preface

I would like to thank my family and friends for their help and encouragement during the preparation of this booklet. It is written as a simple introduction to New Zealand's native orchids and is based on a series of articles published in the **Taupo Times** as a public awareness programme supported by an environmental grant from the **Ministry for the Environment**.

The arrangement of the native orchids in this booklet is in order of leaf shape and number starting with ground orchids and then perching orchids. It follows the quick identification guide page 55. An orchid growing on the ground may not be a ground orchid as perching orchids fall from trees and survive on the ground or simply grow on rocks. Perching orchids are *epiphytes* meaning their roots attach to the outer surface of the support tree and do not penetrate the living tissue of their host as a *parasite* does.

The orchids are listed by common names as these are less likely to change than their botanical names which are currently under review. The common name usually covers one orchid genus which is the first name and individual family members are given species names which is the second name in the botanical name. Some orchid families in New Zealand have only a single species while others have many species. A native orchid is regarded as one which occurs naturally in New Zealand. Many native orchid species are shared with and probably originated from Australia but some have developed into new species only found in New Zealand. These species are *endemic* to New Zealand. The odd-leaved orchid is the only native orchid genus endemic to New Zealand.

The quick guide to identifying native orchids is not intended to be more than a simple guide to the genus and possibly the species. The following books were consulted during the preparation of this booklet and will provide more information and complete identifications of most native orchids.

- Cooper,D 1981: ***A field guide to New Zealand Native Orchids***.
Wellington Orchid Society. 103pp.
- Johns,J & Molloy,B 1983: ***Native Orchids of New Zealand***.
A.H & A.W. Reed Ltd. Wellington. 124pp.
- Moore,L & Edgar,E 1970: ***Flora of New Zealand, Volume II***.
Government Printer, Wellington. 354pp.
- Moore,L & Irwin,J.B. 1978: ***The Oxford Book of New Zealand Plants***. Oxford University Press, Oxford. 234pp.
- Wilson,H.D. 1982: ***Field Guide to Stewart Island Plants***.
Field Guide Publications, P.O. Box 22718,
Christchurch, New Zealand. 528pp.
- New Zealand Native Orchid Group Newsletters.

The word *orchid* usually conjures up the image of the large showy exotic blooms used in floral bouquets and corsages. While those orchids are exotic to New Zealand, they are hybrids developed from part of the native flora of their own countries. New Zealand also has its native orchids which, although not as showy as many of their overseas equivalents, form an important part of the floral heritage of this country.

The first native orchid most people see is the *greenhood* or *Pterostylis* sp. but most people will have walked on the most common native orchid, *Microtis unifolia*, the *onion orchid*.

Native orchids occur naturally almost everywhere in New Zealand. From the coast to the tree line on the mountains and from around the house to the depths of the exotic pine forests. The variety and abundance of the native orchids depends on the habitat in which they are growing.

An Environmental Grant from the Ministry of the Environment has supported an extensive survey by the Native Orchid Group of the Taupo Orchid Society, of the native orchids and habitats in the Kaingaroa State Forest east of Taupo. More than 30 species of native orchids have been found in their countless millions under the pine trees and a reserve area has been established by Timberlands BoP to save some of the orchids from destruction during logging operations.

Other surveys by the New Zealand Native Orchid Group include the mapping of native orchids in their ecological zones throughout New Zealand. Around Lake Taupo some areas have more than 20 species of native orchids and these have been found growing down to the water's edge and even on vertical rock faces.

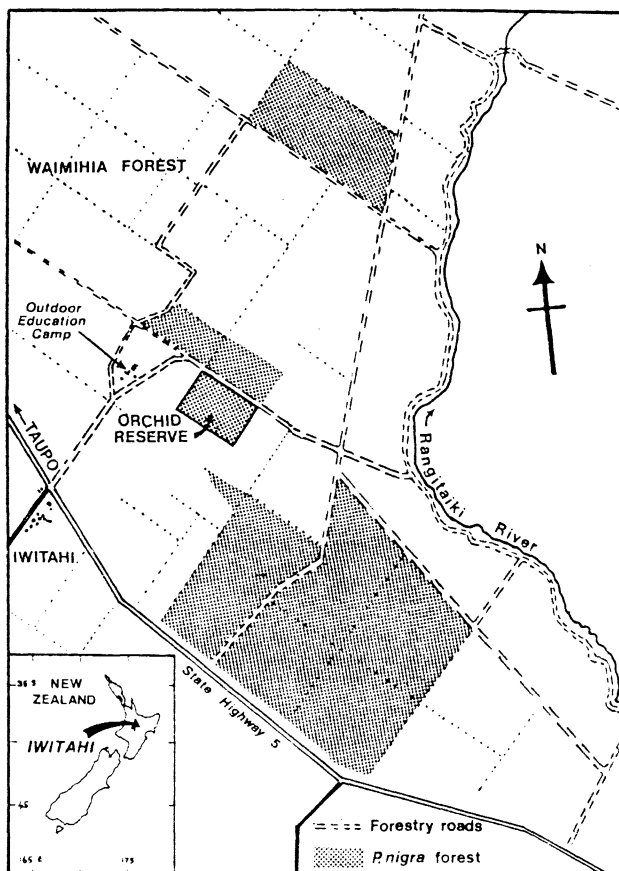
Most people fail to see native orchids for what they are and many orchids are destroyed by spraying road edges and even weeding the garden. In this booklet, native orchids and their habitats are described in simple language in the hope that knowledge of their existence, what to look for and where to find them will help preserve these delightful little plants.

Some native orchids transplant easily and form interesting plants which come up each year and develop into compact colonies with long lasting flowers. The greenhoods grow well in deep clay pots while some species of spider orchid will tolerate being potted in shallow wide pots. Sun orchids are harder to grow as full sunshine dries the plant in a pot. Native orchids with rhizome roots usually require a fungal association to grow and do not grow well in pots.

The native orchid reserve at Iwitahi is a 5.9 ha block of exotic pine forest, *Pinus nigra*, which was planted in 1933. A total of 31 species of native orchid have so far been found in and around the native orchid reserve including the only recorded colony of the bird orchid, *Chiloglottis gunnii*, in the North Island. There is also a large colony of the bearded orchid, *Calochilus robertsonii*, which is one of only 5 known colonies in New Zealand, growing on the roadside near the reserve. Conditions under the *P. nigra* forest must be ideally suited to the native orchids as almost all species found grow in their thousands under these trees while other species of pine support few or no native orchids. Apart from the rare species, it is the sheer abundance and variety of native orchid species that makes Iwitahi native orchid reserve so interesting and important.

The native orchids at Iwitahi were first mentioned to me in 1985 by Ken Scott who had noticed the bird orchids while competing in an orienteering run through the pine forests. The Taupo Orchid Society annual native orchid field day was arranged at Iwitahi in December 1985 during which the abundance and variety of native orchids under the pines was fully appreciated. During that field trip, Lorna Grey from the Tauranga Orchid Society found the single colony of *Chiloglottis gunnii* and I found the colony of *Calochilus robertsonii*. Following discussions suggesting that some protection was needed for these native orchids, I approached the current owners, Timberlands Bay of Plenty, about the possibility of preserving a small block of pine forest around the rare orchids. On 3rd August 1987, together with Trevor Nicholls and Darrell Campbell, I met two of Timberlands BoP representatives, Mark Strong and Glen Johnston, at Iwitahi and we were able to show them the emerging orchids. Glen Johnston then offered to give reserve status to a small key block of *P. nigra* and place a spray ban on the roadside habitat of the bearded orchids. We accepted the offer and the native orchid reserve was created. The native orchid reserve is described as 'stand 04 of *Pinus nigra* in compartment 633 of the Kaingaroa State Forest'.

The native orchid reserve is ideally located for easy access and being close to the Iwitahi Outdoor Education Centre which is used for school camps in summer, it should provide an educational opportunity not readily available elsewhere. In December 1987, the Taupo Orchid Society hosted a two day Native Orchid Forum at Iwitahi which was attended by more than 70 native orchid enthusiasts from all over New Zealand. During that weekend, a number of variations in the form of some of the orchids was noticed raising the issue of more work needing to be done on New Zealand's native orchids. This work is being done and the Iwitahi native orchid reserve will be a great help.



The following native orchids have been found at Iwitahi

Adenochilus gracilis
Caladenia iridescens
Chiloglottis cornuta
Corybas cheesemanii
Corybas trilobus
Gastrodia cunninghamii
Microtis parviflora
Prasophyllum colensoi
Pterostylis banksii
Pterostylis patens
Thelymitra decora
Thelymitra venosa

Aporostylis bifolia
Caladenia lyallii
Chiloglottis gunnii
Corybas macranthus
Earina autumnalis
Gastrodia minor
Microtis unifolia
Prasophyllum nudum
Pterostylis cardiostigma
Pterostylis sp.(unnamed)
Thelymitra longifolia

Caladenia catenata
Calochilus robertsonii
Corybas acuminatus
Corybas oblongus
Earina mucronata
Gastrodia sesamoides
Orthoceras strictum
Pterostylis alobula
Pterostylis graminea
Thelymitra carnea
Thelymitra pauciflora

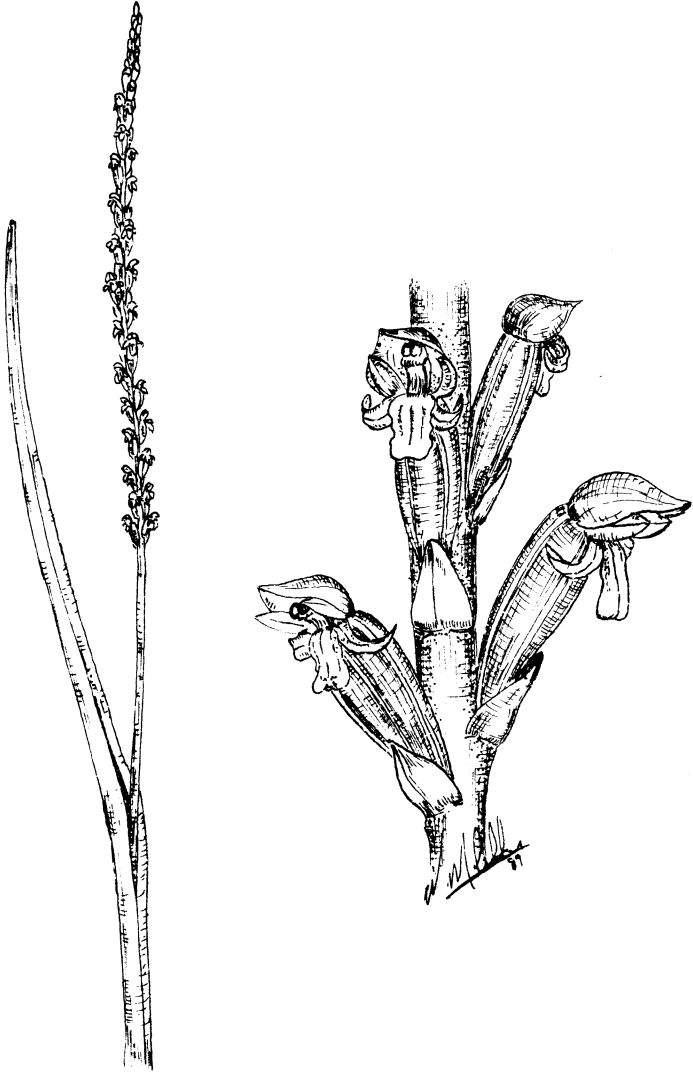
The Onion Orchid.

The most common native orchid in New Zealand is the onion orchid, *Microtis unifolia*, which has the Maori name Maikaika. This orchid is one of several species that likes full sunshine and its size and form depends on the habitat. It colonizes the road sides, gardens, lawns and even cracks in the pavement. It is frequently found as a mass of twisted leaves beside footpaths where it is often mistaken for grass and often is walked on without being noticed.

Well grown, the onion orchid produces a single hairless, fleshy, tubular leaf up to 25 cm tall from a small bulb like tuber. The leaf can appear anytime during the year but it is not until about November that the flower spike emerges from a slit about half way up the leaf. As with most New Zealand native orchids, the flowers are very small. A flower stem may carry more than 75 flowers in the 10 cm long flower spike. The flowers are yellow-green and appear to be self pollinating with seed pods developing on the lower flowers before the flowers higher up the stem have opened. Fully open the flower spike looks like a delicate head of wheat. Peak flowering period is November to January. The onion orchid sets large amounts of seed which germinate readily, producing new plants for the next year. The old plant produces a new tuber which will also flower next year. The mature plant dies down during winter and only the dried seed head remains.

The onion orchid occurs throughout New Zealand from sea shore to the treeline in the mountains although the size of the plant decreases with altitude and cold. Two other less common species of onion orchid are *Microtis parviflora* which flowers in spring between September and November, and *Microtis oligantha*. The latter is the smallest of the trio at about 5 cm tall and frequently has only one or two flowers on the stem.

Microtis parviflora has been found at Rangatira Point and at Rainbow Mountain. *Microtis oligantha* has been found beside a stream on the Desert Road.



Microtis unifolia

The Leek Orchid.

The common leek orchid, *Prasophyllum colensoi*, looks similar to the common onion orchid, *Microtis unifolia*, which may explain the lack of a recognised Maori name for this New Zealand native orchid species. A major difference between the two orchids is that the leek orchid flowers are scented. They are also larger than the onion orchid.

The leek orchid is found in a variety of habitats throughout New Zealand. It usually favours exposed areas close to water although it can also be found on roadside banks, grassy areas and under light scrub. Only 4 of the 80 known species of leek orchid occur in New Zealand and of these, *Prasophyllum colensoi* has the widest distribution.

The leek orchid produces a thick, fleshy, green or reddish stem up to 25 cm tall from a small egg-shaped tuber. The long tubular leaf is taller than the flower stem but is usually bent and withered at the tip or has been eaten by browsing animals. The flower spike consists of up to 20 upright and evenly spaced flowers which are 'upside down' with the lip at the top and no cap-like hood. The half centimetre sized flowers vary in colour from yellow-green to brown-red and have a waxy lustre. The leek orchid flowers in summer with a peak flowering period between November and January. The flowers are self fertilizing and the plants set large quantities of seed. Juvenile plants are easily mistaken for onion orchids and it is not easy to distinguish the common leek orchid from the common onion orchid until the flower spike is produced.

The other common species of leek orchid is *Prasophyllum nudum* which is smaller and has scale like leaves making it easier to identify. The leaves are very small and cling to the flower stem without forming the characteristic tube of the other species. Its red flowers are less open and tend to hang down giving it a wilted look.

Near Taupo, leek orchids can be found in large numbers around Waiootapu, on Rainbow Mountain, beside most of the streams around Lake Taupo and in amongst the tussock on the Desert Road.



Prasophyllum colensoi

The Sun Orchid.

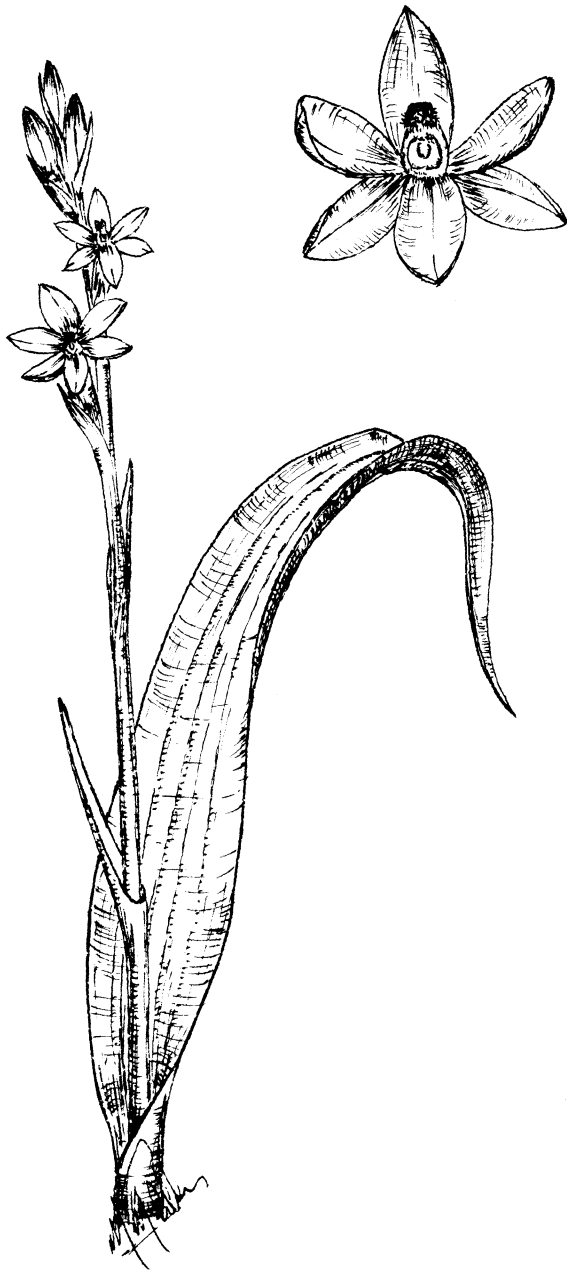
A very common New Zealand native orchid is the sun orchid, *Thelymitra longifolia*, which has the Maori name Maikuku. This orchid grows in a wide range of habitats and is frequently found on dry sunny banks, rocky areas, light scrub and even in gardens. Each plant produces a single hairless, fleshy leaf up to 25 cm long from a small elongated white tuber. The leaf is narrow and pointed. It is curved in cross-section for much of its length but frequently arches over under its own weight. A single spike of flowers emerges from the leaf sheath about November and both the flower stem and the base of the leaf are often red in colour.

The flower stem carries up to 12 star shaped white flowers each about a centimetre across. The flowers require bright sunlight to open and will close up again if it becomes cloudy or just before sunset. Each flower can open and close several times and flowers usually last about a week before setting seed. As with many New Zealand native orchids, the sun orchid is capable of self pollination and if bright sunlight does not occur when the sun orchid is in flower, it will set seed without opening.

The sun orchid occurs throughout New Zealand from sea level to alpine treeline. The time of flowering depends on where in New Zealand it is growing but is usually about December and January.

There are 12 recognised species of sun orchids which fall into three groups - plain flowers, striped flowers and spotted flowers. *Thelymitra longifolia* is the only white sun orchid. The other species are either blue or pink although a yellow species occurs in Australia. *Thelymitra pauciflora* has plain blue to mauve flowers and is frequently found growing with *Thelymitra longifolia* along most of the roads around Taupo. *Thelymitra carnea* has plain pink to dark orange-red flowers and is more common around Tauranga. *Thelymitra decora* has blue flowers with dark blue spots and is commonly found in the scrub and pine forests around Taupo. Less common are the striped sun orchids *Thelymitra pulchella*, which has blue to pink flowers, and *Thelymitra venosa* which has bright blue flowers and can be found growing in standing water in the swamps in Pureora forest.

Thelymitra was the first New Zealand native orchid genus to be founded and *Thelymitra longifolia* has the distinction of being the first native sun orchid to be described (by the German naturalists Johann and Georg Forster on Cook's second voyage in 1773).



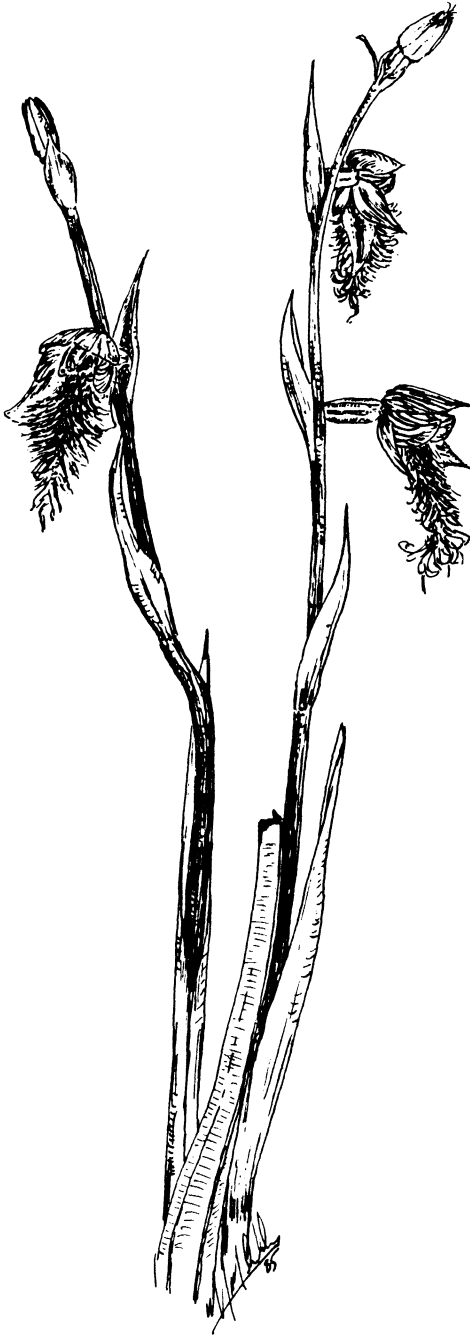
Thelymitra longifolia

The Bearded Orchid.

One of the most beautiful native orchids is the bearded orchid, *Calochilus robertsonii*, which is one of only three species to have been found in New Zealand in the last 50 years. Bearded orchids are generally regarded as rare being found locally in Northland, the central volcanic plateau and Nelson. All three New Zealand species probably came from Australia as wind blown seed and, because they are found in widely spaced localities in New Zealand, it is highly likely that bearded orchids will eventually be found in other places.

The growth habit of the bearded orchid is almost identical to the sun orchid and the two genera are usually found together. The bearded orchid has larger root tubers and more leaves than the sun orchid although the plants are difficult to distinguish until they flower. The bearded orchid produces several erect hairless fleshy leaves up to 15 cm long around the flower stem which grows up to 90 cm tall. The leaves of flowering plants emerge in April soon after the old plant has dried off and remain as erect spikes about 10 cm long throughout the winter. In November the flower stem develops and carries up to six 2 to 3 cm long flowers which look like faces. The flower is dominated by the highly ornamental bearded lip which gives the orchid its common name. The hairs on the lip are red-bronze and shine iridescent blue-purple in sunlight. The other petals are wide, hairless and marked with red stripes as is the broad hood which forms a cap over the flower. Two dark lumps in the centre of the flower look like eyes and complete the face. Usually only one flower is open at any time so the plant remains in flower for many weeks. Peak flowering period is December and the orchid appears to have a rest from flowering after two seasons. The bearded orchid sets large amounts of seed but either few survive or soil conditions for seed germination are very specific and hard to find.

The other species of bearded orchid are *Calochilus paludosus*, which has a brown beard with a hairless ribbon at the tip, and *Calochilus herbaceus*, which has a short copper beard growing from the middle part of the flower lip, blue ribs above the beard and a hairless ribbon at the tip. *Calochilus herbaceus* is so rare that for 40 years it was thought to be extinct. It was only recently found again near Kaitaia in Northland by Doug McCrae. The other two species can be found around Taupo and Rotorua at specific locations. They grow in the centre of Arawa Park racecourse at Rotorua, in the short scrub on Rainbow Mountain and on the bare pumice banks at Iwitahi near the Native Orchid Reserve. Plants of *Calochilus robertsonii* were found at Huka Falls in 1983 but since a path clearing spray programme by Lands and Survey they have not been seen. This highlights the vulnerability of native orchids and the need for a wider public awareness of them.



Calochilus robertsonii

The Duck Orchid.

Some native orchids in New Zealand are extremely rare or very difficult to find and although recorded by early botanical collectors are now possibly extinct. The duck orchid, *Caleana minor*, was reported from both Northland and Rotorua districts in the early 1900s and was infrequently seen until a small colony was rediscovered by Chris Ecroyd in the Rotorua area. This colony has been slowly increasing in size and now consists of about a dozen plants despite an unfortunate encounter with weed spray.

The duck orchid growth habit is similar to the Pink Finger orchid, *Caladenia catenata*, with a small egg-shaped tuber producing a 5 to 10 cm long single, very narrow, hairless, fleshy channelled leaf in spring. The flower stem is slender and hairless supporting up to seven 1 cm long flowers about 20 cm above the ground. The flower has an unusual shape and is 'upside down' with the enlarged yellow-green cup-like column pointing downwards. The thin petals are tinged with red and also point down. The highly ornamental lip is uppermost and has a red-brown enlarged tip which looks like a duck's head. The whole flower looks like a duck in flight and hence the common name. The enlarged tip to the flower lip is hinged and sensitive to the slightest touch. With the weight of an insect landing on it the tip overbalances springing back into the flower and closes on the column. It is thought that this action is to aid pollination but botanists report that the duck orchid like its Australian counterpart is almost certainly self fertilising. Peak flowering period is November and December.

The other Australian species of duck orchid, *Caleana major*, is larger than *Caleana minor* and has not been found in New Zealand. The infrequent sightings of the duck orchid suggests that the orchid arrives by chance dispersal on the wind from Australia but conditions are not consistently favourable for its survival.

The duck orchid has been found growing in New Zealand in dry sandy hills, gumlands, clay land and open patches of Manuka. In the central volcanic plateau it is found in light scrub on geothermal ground. The duck orchid is often found with the bearded orchids in Australia and that pattern is followed in New Zealand as bearded orchids are found in both the Rotorua area as well as the Northland area where it was previously found near Kaitaia.



Caleana minor

Of the 75 known species of *Caladenia* in the world, New Zealand has three and one of those was included in the genus only in the last few years. These are Pink Fingers, *Caladenia catenata*, and White Fingers, *Caladenia Lyallii*. The newest addition to the genus, *Caladenia iridescens*, as yet has no common name. Finger orchids occupy a wide range of habitats. White Fingers prefers high altitudes and can be found in the tussock grasslands and herb fields above the tree line as well as open forest and scrub. Pink Fingers has a wider range of habitats extending through lower altitudes and drier areas growing in open forest and scrub land. *Caladenia iridescens* favours similar habitats to Pink Fingers and the two species are often found in the same areas.

Finger orchids are hairy orchids having fine hairs on both the leaves and stems but not the flowers. The orchid grows from a small round tuber which produces a single strap-like hairy narrow leaf about 10 to 15 cm long at the beginning of winter and a flower stem about 20 cm tall in spring. The leaf of White Fingers is wider than either of the other species and often has a purple tint. The stem supports one or two small flowers which have four of the petals pointing forward like fingers. White Fingers has white petals and a broad white hood over the flower. The centre of the flower has red and yellow bands and the narrow lip has orange ornamental lumps. Pink Fingers has narrower pink petals and hood, and a deeply serrated lip with markings and lumps similar to White Fingers. The flower of *Caladenia iridescens* is similar to Pink Fingers but moss green in colour, vivid throat markings and the stem is about 50 cm tall. All finger orchids flower in late spring to early summer with peak flowering period in December. The flowers set seed readily and the wide distribution of the orchid suggests the seed germinates easily.

The New Zealand species of *Caladenia* are often slightly different to the same species found in Australia and botanists have yet to decide whether the New Zealand variants are in fact different species. All three species are found around Taupo in light scrub through to open native forest. They are also very common in the pine forests where they have spread over large areas and the pine needles bristle with their flowers around about Christmas. Close examination of finger orchids in the Native Orchid Reserve at Iwitahi has shown that there are three forms of the Pink Finger orchid. Apart from the normal pink form there is a red stemmed form with a cream coloured flower and the other form has a pale green flower. The distinguishing feature of the Pink Finger orchid is that the two centre finger-like petals are always crossed. A possible fourth species of *Caladenia* which has a larger vivid pink flower without crossed petals on a stem about 50 cm tall has also been found in the Native Orchid Reserve.



Caladenia lyallii

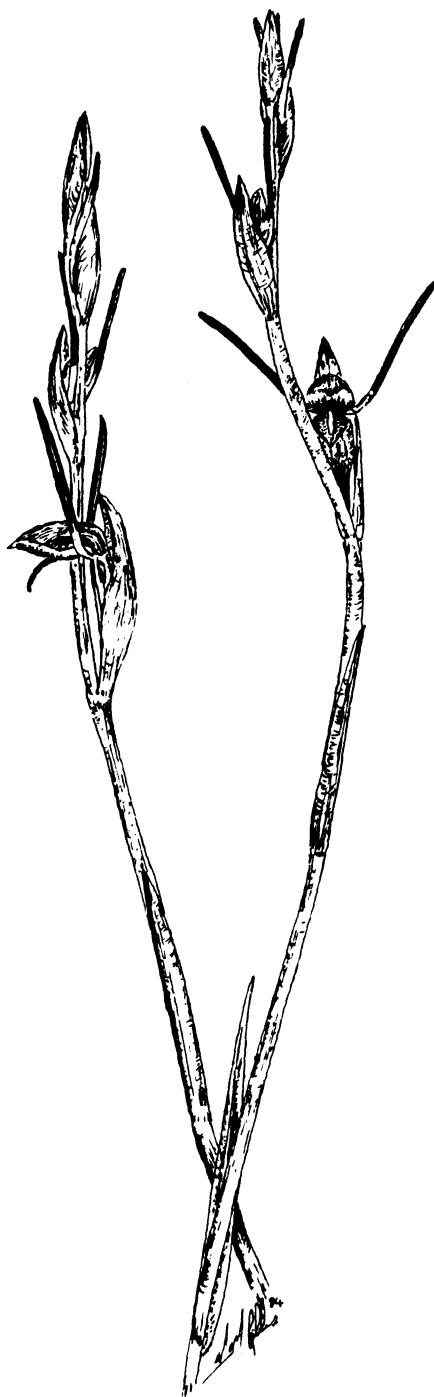
The Horned Orchid.

Most of New Zealand's native orchids are very hardy, tolerating conditions of extreme heat or cold and often growing where other plants have difficulty. The Horned Orchid, *Orthoceras strictum*, is a particularly hardy native orchid which grows mainly on clay banks in full sun throughout much of the North Island and the northern parts of the South Island. The orchid was well known by the Maori for the food value of its large tuberous roots and was variously known by the Maori names - Para, Paratawhiti, Ikaika, Maika, Maikaika, Perei and Mamaika - reflecting the shape and colour of the root and plant and its relationship to the people.

The horned orchid sprouts several rigidly erect, grass-like green leaves in autumn from a large finger shaped root tuber up to 10 cm long. The orchid remains at this stage until early summer the following year when the flower stalk is produced thrusting upwards to about 60 cm tall. The flower stalk supports about 12 erect chocolate-coloured flowers about 1 cm across each facing a different direction from the flower next to it. Each flower has two black tipped, erect, horn-like petals which give the orchid both its common name and botanical name *Orthoceras* means *straight horn*. The lip of the flower is dark red and curls under revealing a bright yellow thickening in the throat of the flower. Although there is only one known species of horned orchid, the pointed hood arching over the flower varies in colour from chocolate brown to lettuce green on plants from different parts of New Zealand.

As with many of New Zealand's native orchids, the horned orchid is self fertilising so that the seed pod under the lowest flower on a stem is fully developed before the top flower opens. Large amounts of seed are set and the horned orchid rapidly colonises the bare clay banks of new road cuttings where competition is minimal unless spray-on-grass has been applied. The parent plant produces a new tuber alongside the previous one before the leaves dry up in the summer heat. Peak flowering period is in January and February and the tall dark stems of the horned orchid are frequently seen above the dry grass along the roadside during the summer holidays.

Because it most often seen by the road it is sometimes called the Roadside Orchid. However, it is also found in other habitats but almost always in areas with poor soils. Around Taupo it is found on the bare pumice banks by rivers and above the lake, near hot springs, along forestry roads and sometimes in light scrub.



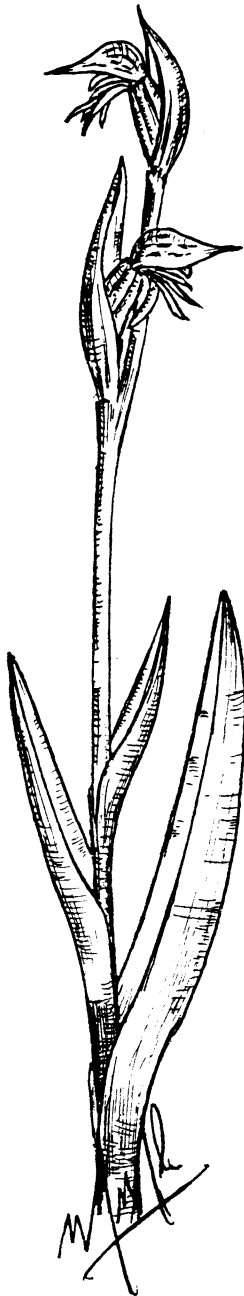
Orthoceras strictum

The Yellow Beak Orchid.

The native orchids of New Zealand are almost all cold climate genera and many can grow throughout the country from north to south and coast to mountain herb fields. The yellow beak orchid, *Lyperanthus antarcticus*, is one of the coldest growing and is mostly found about the 1000m level in the wetter alpine and subalpine zones in the South Island and at lower levels on the colder wetter subantarctic islands. The flowers are often seen poking through the late snows and tolerate the heavy frosts that are common at those altitudes.

The yellow beak orchid is a hairless upright plant growing up to 30 cm tall. Its small rounded root tuber produces a spring growth of three erect short flax-like leaves folded around the yellow-green flower stem which supports two or three yellow 1.5 cm long flowers. The flower has a large horizontal sharp pointed hood arching over the narrow pointed petals and lip. The hood is usually blotched with red and occasionally the leaves are also marked. The flowers are usually orientated to point in different directions on the stem and the large erect flower bracts give the flower spike a heavy appearance. The yellow beak orchid flowers are sweetly perfumed and appear in summer with peak flowering period in December and January.

Although there are about 12 species of *Lyperanthus* worldwide, only one is found in New Zealand and it is endemic to this country. It has been suggested that the New Zealand species originated from Australia thousands of years ago and has evolved to its present form in this country. Yellow beak orchids are usually found growing in wet and boggy areas on upland forest margins, subalpine meadows and scrub lands, tussock grasslands and peaty ground. They are more common in the South Island but are also found in the North island in the Tararua and Ruahine Ranges. They are also found in the subalpine districts from Rotorua and Taupo southwards particularly around the central volcanic plateau where they are reported from Tongariro National Park and the Desert Road area.



Lyperanthus antarcticus

The Summer Greenhoods.

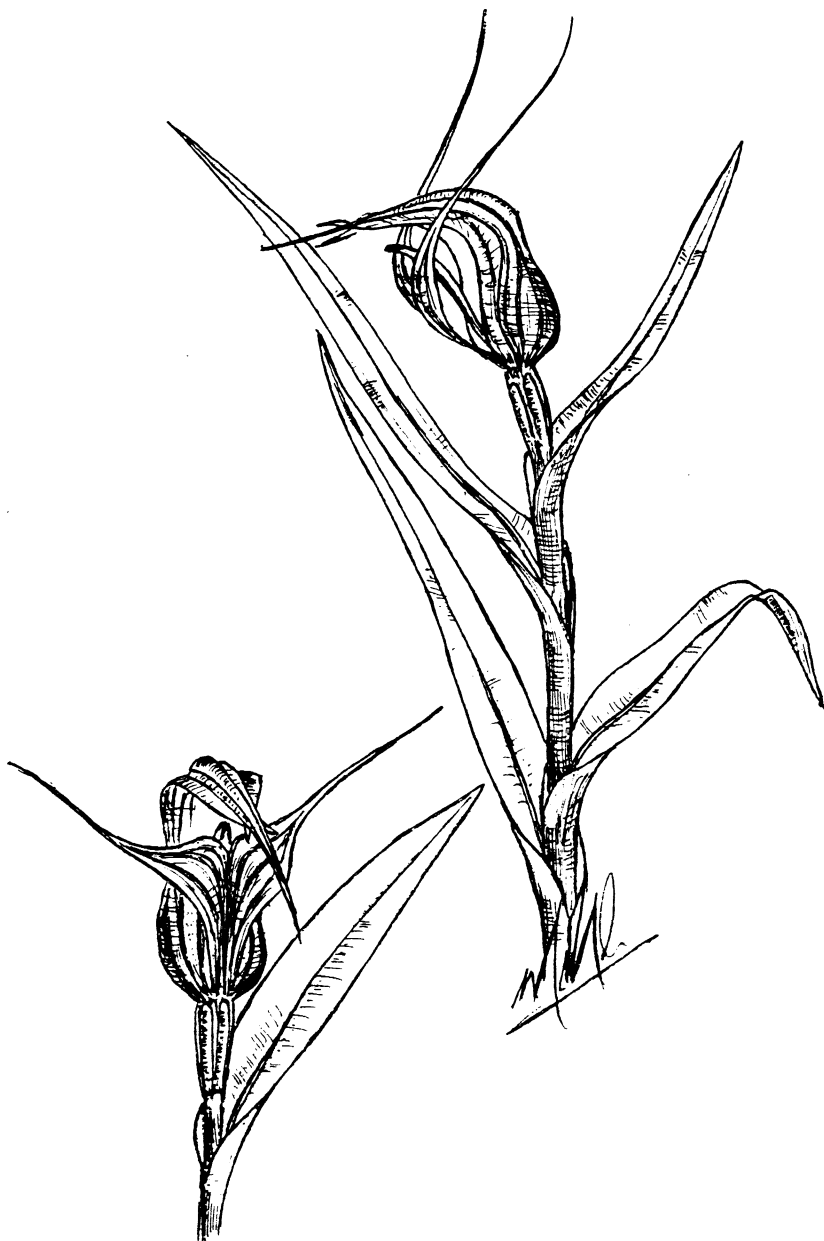
Greenhoods form the largest family of native orchids with about 20 of the 70 known species being found in New Zealand. Most occur throughout the country but some are only found in one or other Island while others require specific habitats. The greenhoods fall into three main groups - summer flowering, winter flowering and multiple flowered. The latter are much smaller than the single flowered species and are not easy to find in their grassy habitats.

The summer flowering common greenhood orchid, *Pterostylis banksii*, is one of the largest flowered native orchids in New Zealand. Its pointed hood looks like a Kiwi beak and gives rise to the Maori name Tutukiwi. The plant can usually be found on the edge of light scrub or semi-shaded walking tracks. It produces a fleshy grass-like growth up to 25 cm tall from a small round tuber. Several 5 to 10 cm long fleshy leaves with a prominent central channel are spaced up the stem which carries a single 2 to 3 cm green and white striped flower. The flower is highly specialized with the petals forming a hollow chamber which is characteristic of all species. The tips of the petals are whisker-like and are often red as is the point of the hood. The hollow chamber in the flower is used to trap insects which pollinate the flower as they escape. The lip which is thin and extends out through the notch between the whisker-like petals, is touch sensitive and flicks the insect into the flower as it lands.

The common greenhood usually flowers in summer but specimens can be found in flower as early as mid September in some areas. Other species of greenhoods in the summer flowering group require specialized knowledge to identify them. All have a similar shape and growth habit but the whisker-like petals and the point to the hood may be shorter or twisted or held at different angles. For example, *Pterostylis cardiostigma* grows as a large solitary erect plant with an upwards pointing flower which looks like a bud even when fully open. One notable exception to the greenhood shape is *Pterostylis plumosa* which has no whisker-like points but has a yellow bottle brush like lip. This species is not common and is mostly confined to a few places in the North Island.

Only one multiple flowered Greenhood, *Pterostylis tristis* (formerly *Pterostylis mutica*) is reported from the central volcanic plateau near Mount Tongariro in the National Park. The other common species *Pterostylis cynocephala* is known only from the South Island.

Several species of Greenhood orchids can be found around Taupo and feature prominently in the Taupo Botanical Society Gardens.



Pterostylis banksii

Winter Greenhoods.

There are three winter flowering greenhood orchids but only two of these are commonly found throughout New Zealand. They are *Pterostylis trullifolia* and *Pterostylis alobula*. These two greenhood orchids are almost identical and are frequently found growing together. The third species is *Pterostylis brumalis* which is only known from North Island Kauri forests.

In comparison with the summer flowering greenhoods, the winter flowering ones are slender and tiny, rarely growing to more than 10 cm tall. They have a distinctive juvenile form which does not flower until the following year. Unlike the summer flowering species which have grass-like pointed leaves, the winter flowering greenhoods have rounded rosette leaves each of which is less than a centimetre across. Colonies of these orchids usually include mature and immature plants with the whole rosette of leaves covering an area the size of a 20 cent coin. The slender flower stem rises from the centre of the rosette and holds a single 1 to 2 cm green and white striped flower up to 10 cm above the plant. The flower has the characteristic hollow chamber of the greenhood orchids, the pointed petals are upright, and the point of the hood is short.

The difference between the two common winter flowering greenhood orchids can be seen in both the flowers and the leaves. *Pterostylis alobula* has no lobe at the notch between the two upright pointed petals and this gives the name to the species. The other difference is the lack of the heavy net-like veins on the leaves which are so prominent on the leaves of *Pterostylis trullifolia*. The leaves of the latter are also more pointed or trowel shaped which gives this species its botanical name.

Peak flowering for both of these greenhood orchid species is in May and June but they can be found in flower as early as the end of March in some areas and as late as August in others. They are usually found under light scrub and almost always growing in a rough short moss rather than in the bare soil or leaf mold. Their requirement for a mossy habitat means that colonies are widely scattered and restricted in size although each colony can have several hundred plants.

These species of winter flowering greenhoods can be found growing around Lake Taupo, occasionally even growing on the vertical mossy faces of the rock cliffs above the lake. They are usually common under bracken and can be seen beside many walking tracks in the area.



Pterostylis trullifolia

Pterostylis alobula

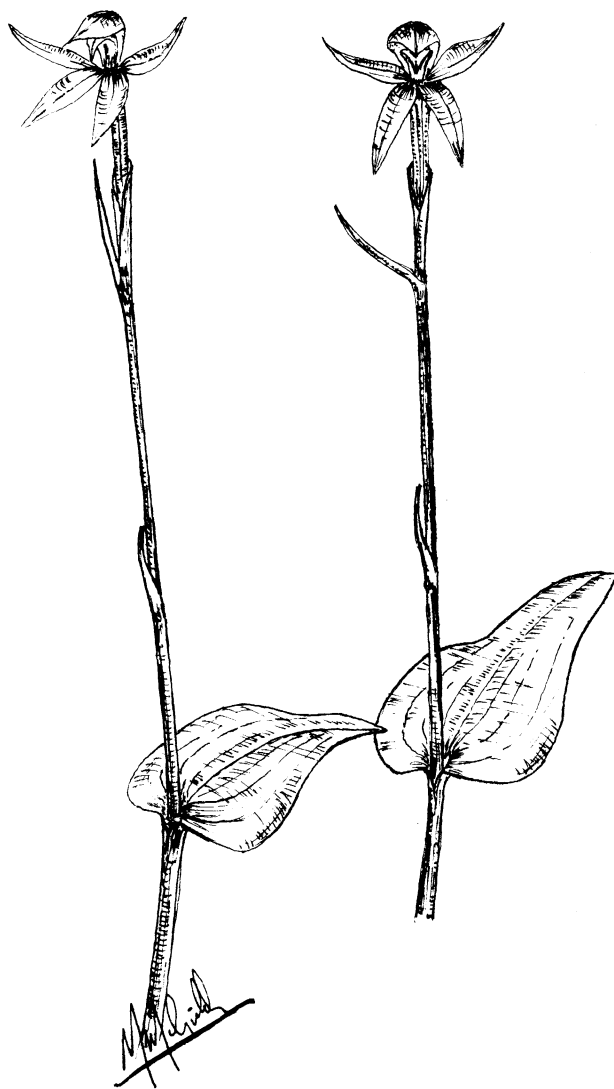
The Slender Forest Orchid.

The tiny flowers of New Zealand's native orchids are rarely seen by anyone who is not looking for them. The slender forest orchid, *Adenochilus gracilis*, however, can present such a massed display when in flower that it is hard to miss. Although it was probably known by the early Maori there does not appear to be a common Maori name for this orchid.

The slender forest orchid is saprophytic relying almost entirely on an association with a fungal layer in the leaf litter on the forest floor to grow. Without the fungal layer the orchid soon disappears. The reason for this is that this orchid has no bulb or tuber in which to store food for hard times but grows from a slender branching furry rhizome type root which gets food from the fungal decomposition of the leaf litter. Because of the rhizome root structure, what appears above ground as a single plant is actually one shoot of many interconnected shoots. Hence, what appears to be a large colony of these orchids may be a single large plant.

Each shoot produces a single wide shiny pointed leaf, up to 5 cm long, attached directly to the stem and held several centimetres above the ground. The stem grows to about 20 cm tall and supports one or sometimes two starry white flowers. Four of the petals are widely spaced forming an open star shape. The hood over the flower is a greenish white while the throat of the flower is marked with red bands and there are prominent rows of yellow and white lumps on the pointed lip. The flower sets seed readily but is frequently grazed before the pods can ripen. The slender forest orchid flowers from November to late January with peak flowering period in December.

The slender forest orchid is found from the Auckland region south but usually not in large numbers. Habitats are usually open beech and Kanuka forests where the orchid grows in mossy depressions. Large numbers of the slender forest orchid have been found in the pine forests around Taupo and, where the decaying pine needle layers are thick, the flowering displays of this orchid in summer are spectacular.



Adenochilus gracilis

The Pixie Cap Orchid.

Many of New Zealand's native orchids are small and secretive, hiding beneath the bracken and scrub on the banks beside roads and tracks. Often they are within a few centimetres of trampers' feet and yet they are rarely seen. The pixie cap orchid, *Acianthus sinclairii*, is a good example of these secretive orchids and this probably accounts for the lack of a common Maori name for the orchid. Although about 20 species of *Acianthus* occur throughout the world, only 3 species are found in New Zealand. Two are shared with Australia.

The heart shaped leaf of the pixie cap orchid emerges from the moss or leaf litter about May and unfurls to reveal the buds which will open about June. As with most ground orchids, the pixie cap orchid grows from a small oval tuber. The leaf is held just above the ground on a square stem which grows up to 12 cm tall and supports five or more delicate, almost transparent green 0.75cm flowers. Both the stem and the flowers have prominent red ribs. The flowers are also usually blotched with red markings and the petals have fine points. The hood over the flower is broad and arched like a 'Pixie Cap' giving the orchid its common name. The flowers last for several weeks and most set seed. The seed capsule of the pixie cap orchid is unusual in that it is twisted. The capsules point straight up and are usually tight against the stem.

The second New Zealand *Acianthus* species is *Acianthus reniformis* which flowers in spring with peak flowering about August and September. This species has very thin petals giving it an insect like appearance and hence its common name, the gnat Orchid. *Acianthus reniformis* is restricted to the North Island and northern part of the South Island while *Acianthus sinclairii* and the third species, *Acianthus viridis*, occur throughout New Zealand. *Acianthus viridis* is the last to flower with peak flowering period in November and December. *Acianthus reniformis* has been renamed *Cyrtostylis reniformis* as orchidologists review the native orchids in each genus.

Around Lake Taupo pixie cap orchids and gnat orchids can be found beneath light scrub and bracken or growing in the moss on top of rocks in medium shade. They are usually found in colonies of several hundred plants but occasionally larger colonies are found covering areas of several square metres.



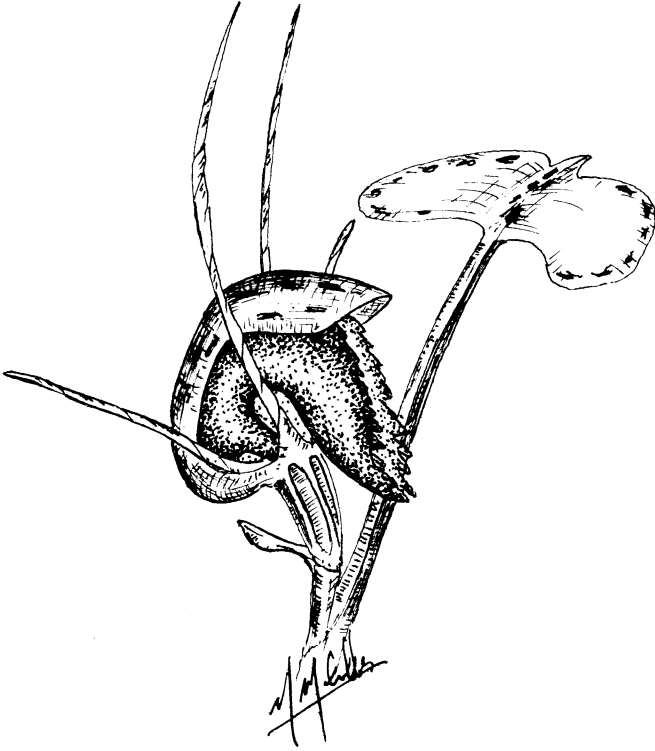
Acianthus sinclairii

The Spider Orchids.

Spider orchids, *Corybas* sp., are amongst the most secretive of New Zealand's native orchids as they grow close to or even below the leaf litter on the ground. They are also deciduous, as are most ground orchids, and hence are seldom seen outside the flowering season. The most common spider orchid is *Corybas trilobus* which occurs throughout New Zealand. Further testimony to its secretive nature is the lack of any Maori name for these orchids.

Spider orchids usually appear in early spring with a single fleshy broad leaf which varies in size, shape and marking depending on the species. The leaf is held horizontal just above the ground - the underside being a glistening white while the upper surface is a light green and often marked with dark red spots, veins or blotches. The leaf of *Corybas trilobus* is 1 to 3 cm in diameter and rounded with a small but distinct central point or lobe separating the two major lobes of the leaf thus giving the species its botanical name. The 1 cm flower, which is held below the leaf, is usually dark red with a pale green pointed cap blotched with red. Four highly specialised petals are flat, narrow, twisted ribbons which are held erect above the flower and can be up to 8 cm long. Seen from above the flower looks like a long legged insect or spider and hence its common name. When pollinated the flower stalk grows longer holding the seed pod well above the leaf to allow air movement to disperse the seeds. Peak flowering period is October. Spider orchids also spread by root propagation as each root tip produces a new bulb. Consequently spider orchids develop compact colonies of interconnected plants covering several square metres. The largest single colony I have seen was about 20 m wide by 60 m long.

There are several species of spider orchid in New Zealand and they vary markedly in the habitat they occupy. *Corybas trilobus* can be found in low light areas under scrub and bracken or on the forest floor. They are plentiful under some species of pine in the forests around Taupo. *Corybas acuminatus* which has a pointed leaf and longer filamentous petals grows in the moss on ridges in similar habitats occupied by *Corybas trilobus*. The largest spider orchid, *Corybas macranthus*, can be found in damp places and is often found on the banks above streams. *Corybas rivularis* actually grows in flowing water and has almost transparent red and white striped flowers held above the leaf. It has been found in wetlands along the Desert Road and by some bush streams around Taupo.



Corybas trilobus

The Helmet Orchids.

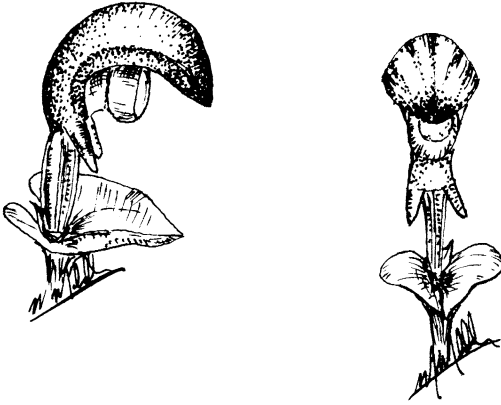
Only a few of New Zealand's native orchids flower in winter. The Helmet Orchid, *Corybas cheesemanii* formerly known as *Corybas aconitiflorus*, is one of these orchids. It is a member of the spider orchid family and it is found in both North and South Islands. However, it is seldom seen even though trampers, hunters and forestry workers probably walk on colonies of these plants in some areas. Apparently there is no recorded Maori name for this little ground orchid.

The helmet orchid produces a small pointed heart-shaped leaf from a small round root tuber which grows in the fungal layer in the leaf litter on the forest floor. The stalk is short and the leaf barely reaches the surface of the litter layer. The 1 cm long leaf is held horizontal and partly wraps around the base of the short flower stalk. The flower is often larger than the leaf at 1 to 1.5 cm long and barely emerges above the leaf litter. Frequently it remains buried with just the top of its pale green helmet-like hood visible which explains why it is seldom seen. The flower is unusual in that the pointed hood almost encloses the whole flower. The tip and base of the hood are purple and two short white spurs hang down below the flower. Unlike the summer flowering spider orchids, the helmet orchid does not have long whisker-like petals.

Little is known about the pollinators of this orchid but in contrast to the short flower stem, when the seed pod develops the stem rapidly grows to hold the seed capsule 10 to 15 cm above the ground where air movement can disperse the seeds. These tall fleshy white stems are often the only indication that the helmet orchid is present.

As with spider orchids, the helmet orchids also propagate from root tubers and form dense colonies with many hundreds of interconnected plants. Peak flowering period is May and June.

The helmet orchid is usually found under scrub, bush and pine forest around Taupo. A second species of helmet orchid, *Corybas unguiculatus*, is also known. It is rare, being reported only from the north of the North Island.



Corybas cheesemanii

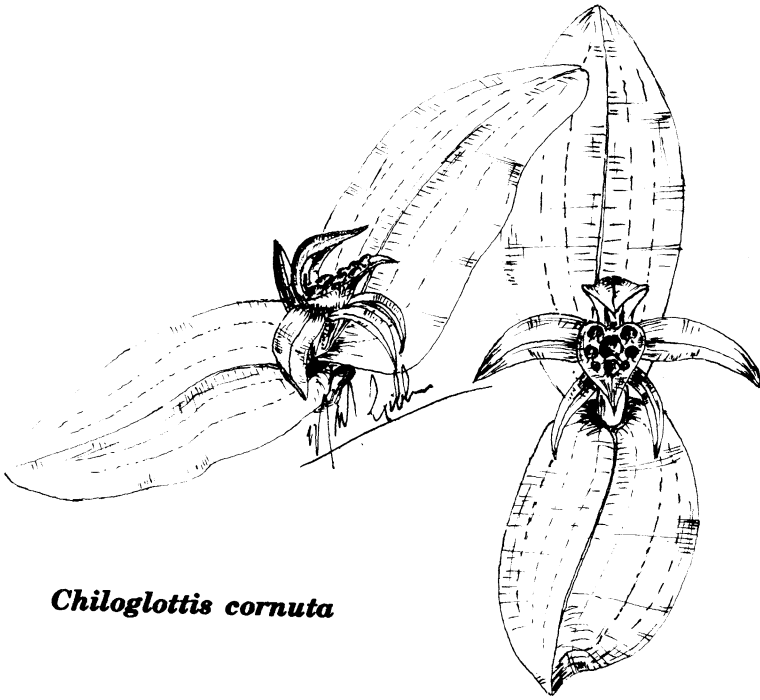
The Bird Orchids.

One of the more common native orchids is the bird orchid, *Chiloglottis cornuta*, which is found throughout New Zealand from sea level to the mountain tree line and beyond. In undisturbed forest and scrub, the bird orchid can colonise large areas but may still be overlooked by trampers even as they walk on the plants.

The bird orchid grows from a small round white tuber producing two hairless, fleshy, broad, shiny, 5 cm long leaves which usually lie opposite each other on the ground. The short flower stem barely raises the flower above the leaves allowing walking insects to enter the flower directly without climbing. The flower features a broad green pointed hood which arches over the fleshy tongue-like lip. The lip has 8 large shiny rounded lumps inside and these are often purple with the purple colouring the whole inside of the lip. Together the hood and the lip look like the open beak of a bird with a mouth full of berries and hence the common name. The other petals are narrow and spread wide. The bird orchid sets seed readily and the stem then grows rapidly lifting the developing seed pod up to 25 cm above the ground. As the flower remains on the seed pod for some days it is easy to believe that the tall stemmed plants are a different species of orchid from the short stemmed plants. The flowering season is from October to January with the peak flowering period in November and December.

The bird orchid propagates from both seed and root extensions and, left alone, will develop large densely packed colonies. It grows in a wide range of habitats from bogs and grass lands to forest and scrub lands making it one of the more successful native orchids. It is commonly found around fallen logs and even growing in cracks in the bark of logs and growing trees. Around Taupo it is common in most scrub areas and throughout the pine forests.

Of the 7 species known world wide only 3 have been found in New Zealand. The other 2 species being rare, *Chiloglottis gunnii*, or possibly extinct, *Chiloglottis formicifera* which was last recorded from Northland in the early 1900s. *C. gunnii* has only been found in Hanmer Forest Park and Richmond Range Forest Park in the South Island and the Iwitahi Native Orchid Reserve area near Taupo in the North Island. *C. gunnii* is a larger fleshy plant with a more open purple tinged flower supported about 10 cm above the ground. The colony at Iwitahi is frequently grazed before the seed ripens which could account for the orchids limited spread at each location.



Chiloglottis cornuta



Chiloglottis gunnii

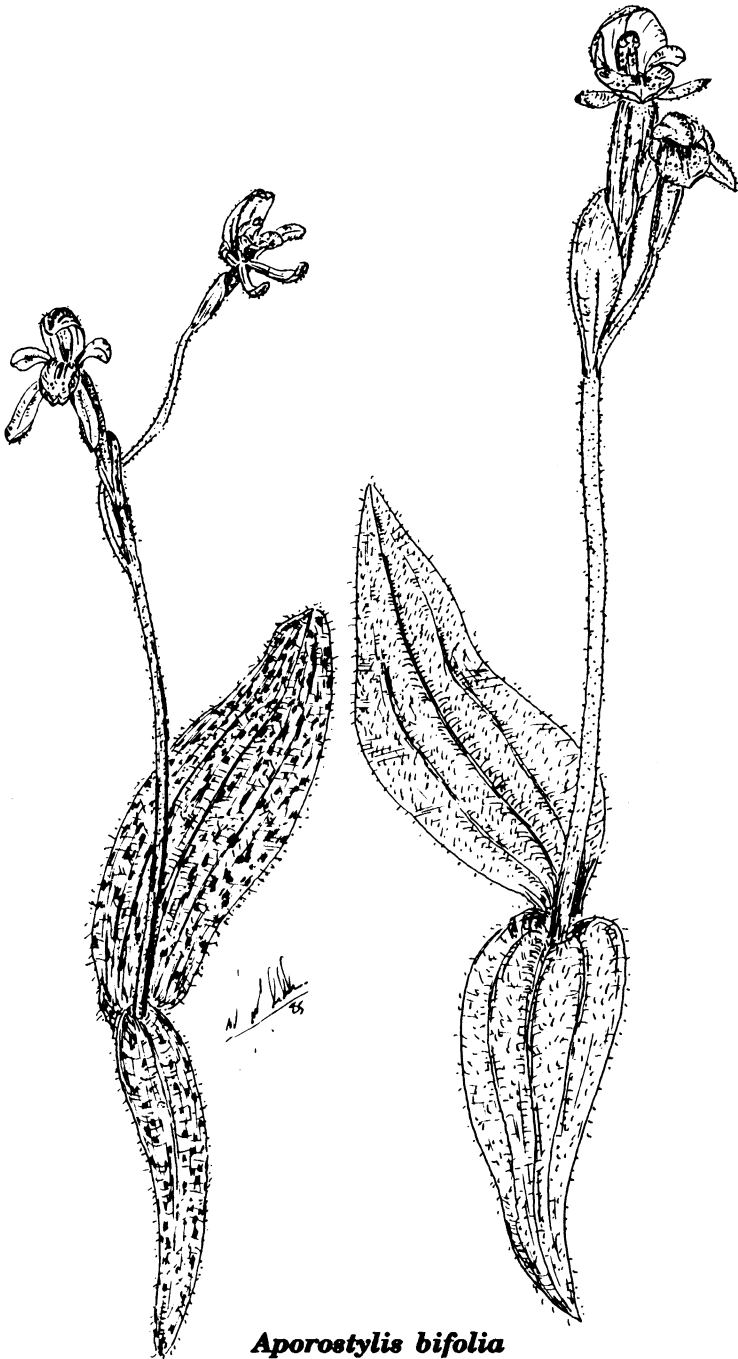
The Odd-Leaved Orchid.

A feature of several of New Zealand's native orchids is hairs on the stems and leaves. The odd-leaved orchid, *Aporostylis bifolia*, also has hairs on the flowers. Although there are two apparently different forms of this orchid, there is only one known species and it is the only native orchid genus endemic to the New Zealand botanical region. The odd-leaved orchid is found throughout New Zealand from the tree line in the North and South Island ranges to near sea level in the South Island and on the Chatham Islands.

The plant produces a pair of broad pointed 4 to 5 cm long leaves one of which is larger than the other and gives the orchid its common name. The leaves usually lie flat on the ground and are pale green mottled with red blotches. The leaves are often heavily ribbed and are covered with hairs making the plant look like a young Scotch thistle. The flower stem is slender, hairy and supports one or two flowers about 20 cm above the ground. The flowers are white with a fine red stripe along the rib of the petals which are long, narrow and channelled. The flower lip is broad and marked with yellow patches and dark red spots. The hood over the flower is broad and is covered with fine white hairs as are the other petals. Peak flowering period is December to January and the orchid usually produces plenty of seed.

Another form of the odd-leaved orchid has no red blotches on the leaves or red stripes on the petals. In this form the hairs on the flower come from small green blisters on the back of the petals which are wider than in the red striped form. Variations of this type occur in several native orchid species and, although most are minor variations of the particular species, some may be new species yet to be identified and described by botanists.

The odd-leaved orchid likes a moist but not wet habitat. It can usually be found in or close to mossy patches on the forest floor where large colonies can develop providing a spectacular display in the flowering season. Around Taupo the odd-leaved orchid has been found in the Opepe Reserve bush and in the Kaimanawa Forest Park. Both the red and green forms have also been found in large numbers in mossy patches in the pine forests between Taupo and Rotorua. It can also be found in similar habitats around the lake. However, because the new plant looks so much like a young thistle it is usually over-looked unless it is in flower.



Aporostylis bifolia

The Ladies' Tresses Orchid.

The ladies' tresses orchid, *Spiranthes sinensis*, is one of only two evergreen ground orchids found in New Zealand, the other being the tongue orchid. While it is the only species of this genus found in New Zealand, there are about 50 species to be found throughout the temperate region of the world. The genus name *Spiranthes* means *coil flower* referring to the spiral arrangement of the flowers and the species name *sinensis* means *of China* indicating the typical location of this orchid. Botanists have recently divided the species into two subspecies with the New Zealand species, *S. sinensis ssp australis*, meaning *southern* also being found in Australia, New Calidonia and north to Asia.

The ladies' tresses orchid produces two or more erect pointed paddle-shaped leaves from the cluster of tapering tuberous roots around the base of the plant. Smaller scale-like leaves extend up the flower stem which can grow to more than 60 cm tall. The leaves are generally rolled inwards and have prominent ribs. The growth habit varies from small slender plants to very robust specimens forming tall clusters of vegetation and flower heads easily visible at a time when most associated plants are declining in the summer heat. The flower stem carries numerous small pink flowers which are closely packed side by side up the stem. Each flower is orientated to point slightly further around the stem giving the distinctive spiral effect which characterises this orchid. The flower spike usually carries enough flowers to complete 5 or 6 complete spirals around the stem with each flower opening in sequence from the bottom. The flower is sweetly scented with pink petals forming a tube about the white lip. In the South Island the flowers may not open but still readily set seed suggesting the flower is self pollinating as are many New Zealand native orchids. The ladies' tresses orchid flowers in mid summer with peak flowering period in February.

The habitat of the ladies' tresses orchid is usually a wetland or boggy area from coastal dunes to damp upland tussock grasslands. It is commonly found amongst grasses, rushes and sedge communities around lakes and swamps making it locally specific although it is found throughout most of the country as far south as mid Canterbury and South Westland. On the central volcanic plateau ladies' tresses orchids have been found around the Rotorua lakes and wetlands as well as the subalpine bogs and ponds east of Taupo in the Kaimanawa Ranges.



Spiranthes sinensis

The Tongue Orchid.

Hidden away in the Motutangi Swamp in Northland is one of the most spectacular native orchids in New Zealand, the tongue orchid, *Cryptostylis subulata*. This orchid genus consists of about 18 species worldwide with 5 in Australia and only one in New Zealand. The tongue orchid was first found in New Zealand in 1975 by the late Digby Graham and is probably a recent natural arrival from Australia which is the probable source of many of our native orchids.

The tongue orchid is an evergreen ground orchid similar in growth habit to the ladies' tresses orchid. The plant produces several 10 cm long yellow-green, spear-shaped, flat oval pointed leaves on 10 cm long rounded stems from a cluster of fleshy roots at the base of the plant. The main flowering stem can grow up to about 1 metre tall with several scale-like leaves and supports up to 20 showy yellow and red flowers. The 2 cm long flower is regarded as 'upside down' because the lip is above the narrow hood. The hood and petals are yellow-green and erect leaving the large colourful lip pointing slightly downward from horizontal. The lip is purple-red for most of its length and has dark purple-black ridges along the centre ending in two dark lumps near the tip. The inner part of the lip curves around the column partly concealing it and giving the orchid its botanical name - *cryptostylis* means *hidden column*.

The flower is thought to mimic a female ichneumon wasp and reports from Australia recount how male wasps will attempt to mate with the flower and in doing so pollinate it. Reports also suggest that this pseudocopulation is also being carried out by the same wasp species on the tongue orchids in New Zealand. The tongue orchid flowers from November to March with peak flowering period in December and January. The flower is almost certainly insect pollinated and readily sets seed.

The tongue orchid is one of the few native orchid genera not found on the central volcanic plateau. At present the orchid is known only from the one location in New Zealand, the Motutangi Swamp in Northland where it grows in wet peaty soil amongst other wetland flora such as rushes, sedges, flax, manuka and the other evergreen wetland orchid, ladies tresses. The tongue orchid forms large clumps and the tall robust stems tend to stand out above the other plants.



Cryptostylis subulata

The Potato Orchid.

One of the more unusual native orchids in New Zealand is the potato orchid, *Gastrodia cunninghamii*. This native orchid is entirely without green pigment and is usually found growing in deep leaf litter under scrub and bush. The potato orchid was well known for the food value of its large tuberous root by the Maori people who called the orchid by various names - Perei, Huperei, Maukuuku, Para and Uhi pereii.

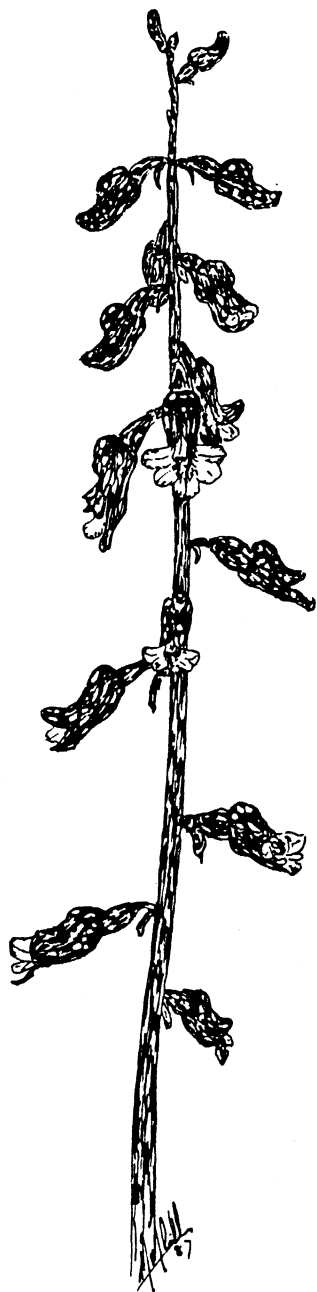
The large potato-like tuberous root from which the plant grows gives the orchid its common name. The root tuber develops from seed or from small root extensions from the previous season's plant before the main tuber rots away in much the same way as the potato grows. However, whereas the potato produces a green fleshy plant and can grow in almost any soil, the potato orchid without any green chlorophyll for photosynthesis must rely on an association with a fungal layer in the soil for the nutrients it needs to grow. Without chlorophyll the potato orchid has no need for leaves and hence the flower stem produced from the tuber has only scale-like bracts where leaves would normally be expected.

In growth, the potato orchid shoot looks like an asparagus spear eventually rising to about 60 cm tall and mottled purple-brown in colour. The stem appears in December and supports up to 40 purple-brown flowers which point down. The flowers open in late December to January revealing a pale creamy-yellow inside and a fetid smell like rotten meat which attracts the flies that pollinate the flower. The smell is quite appropriate as the flower buds look very much like maggots. As the seed pods develop the flowers point upwards holding the seed capsules away from the stem. The stem and seed capsules dry up in summer and allow the plant to be found later in the year.

There are three species of potato orchid in New Zealand, *Gastrodia minor* which is the smallest and looks like a large hair pin as it grows, *Gastrodia cunninghamii* and *Gastrodia sesamoides* which are similar in size but differ in flower shape and colour and the number of flowers on the stem. *G. sesamoides* is lighter in colour being almost yellow and has fewer well spaced flowers than *G. cunninghamii*. The potato orchid can be found in localised patches throughout New Zealand in poorly lit moist but not wet areas. All three species are found around Taupo - often in older gardens under undisturbed Rhododendron and Azalea bushes. They are also found in the pine forests where they can develop into large colonies. *G. sesamoides* is reported along many of the walking tracks in light scrub in Hawke's Bay but in general these orchids are usually hard to find as they blend well with the dappled background of their shady habitats.



Gastrodia minor



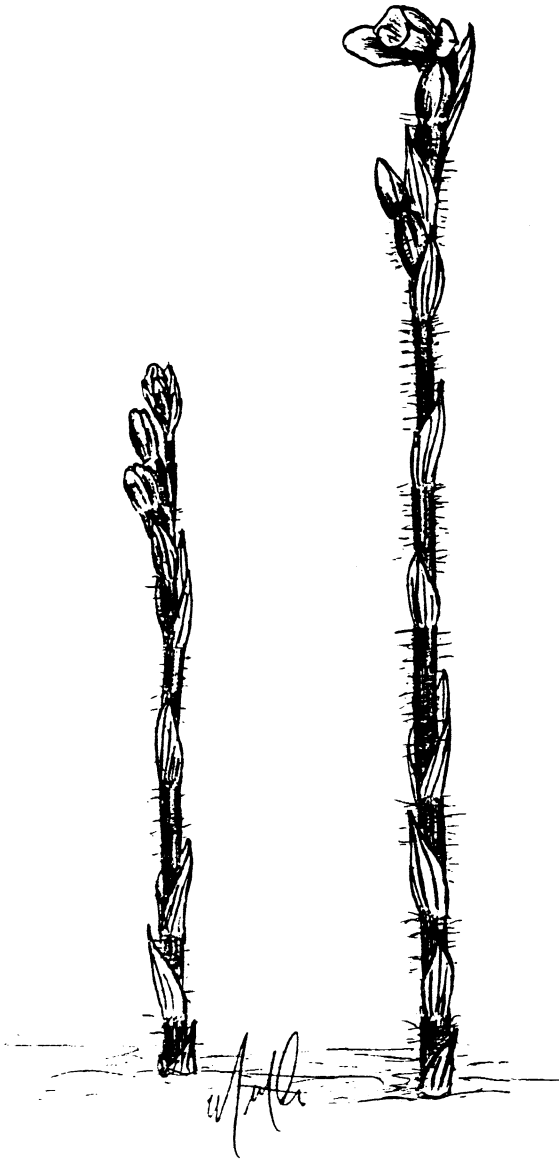
Gastrodia cunninghamii

Yoania.

Little is known about the peculiar and obscure non-green native orchid *Yoania*, *Yoania australis*, because it spends much of its life below ground. This growth habit means that other species of this orchid genus may exist but have yet to be found. The orchid genus was named after the Japanese botanist Wudogawa Yoan and at present only a few species are known from Japan, Africa, the Himalayas and New Zealand. The New Zealand species which is endemic to this country was described in 1963 by the New Zealand orchidologist Dan Hatch. *Yoania* is rare and until recently was only found under mixed forests of Kauri, Taraire and Nikau in the north of the North Island.

Yoania is a saprophytic orchid apparently spending most of the year below ground as a fragile fleshy rhizome growing in close association with a puff-ball fungus that lives in close contact with roots of the Taraire tree, *Bielschmiedia taraire*. The 0.4 cm diameter rhizomes branch readily and form a network through the decaying leaf litter where the fungus grows. In early summer flower stems are produced from the ends of the branches and nodes on the rhizomes. The pink-brown stems are erect and have several small white scale-like leaves with prominent pink veins spaced up the stem giving it a banded appearance. The stem is covered with fine hairs and grows about 12 cm tall supporting up to 5 small flowers. The flowers are about 0.5 cm long dark red-brown at the base changing to pink-white at the tips of the petals and lip. The short hood and concave lip combine to form a tube around the centre of the flower. All the flowers may not open but the orchid readily sets seed suggesting that it is self pollinating. Peak flowering period is December and January.

Yoania has not been found on the central volcanic plateau but that may be because it is not easy to find. The typical habitats for *Yoania* are dark damp areas in association with Taraire trees. Known locations are mostly around the Kaipara Harbour, Northland and the Coromandel Peninsula. More recently *Yoania* was reported from the north of the South Island near Collingwood in the Kaihoka lakes area. There the plant association was not with Taraire but Kohekohe, *Dysoxylum spectabile*. The common factor between all of the locations, however, is the Nikau palm, *Rhopalostylis sapida* and *Yoania* may well be found in other areas where the Nikau grows.



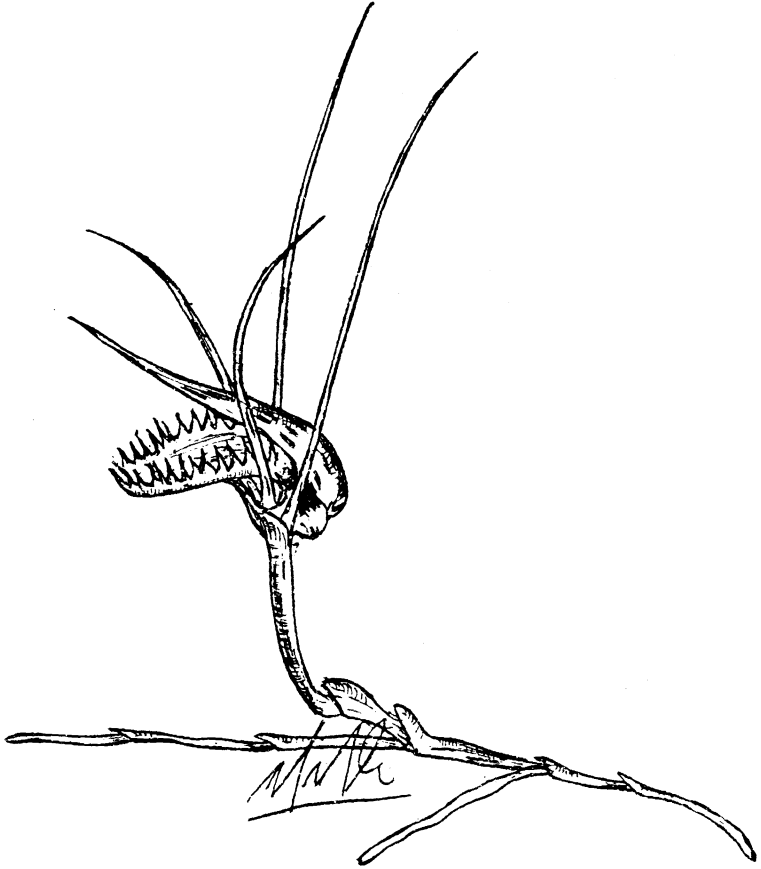
Yoania australis

The Hidden Spider Orchid.

The hidden spider orchid, *Corybas cryptanthus*, is a little known though widely distributed native orchid which has been reported from various locations in the North Island and the north western parts of the South Island. It is one of New Zealand's three non-green ground orchids and is the only non-green member of the spider orchid, *Corybas* family. Like the other non-green orchids, the hidden spider orchid spends much of the year below the leaf litter and hence is seldom seen. In many locations the flower never appears above the ground and the plants are only marked by the characteristic elongated stem to the seed capsule after the orchid has flowered.

The hidden spider orchid grows from a fleshy branched rhizome which has small scale-like leaves. The rhizome is saprophytic and spreads through the fungal layer in the leaf litter on the forest floor. The plant produces a single pink-white flower streaked with red from the ends of the rhizome branches. There is no leaf although there is a scale-like bract under the flower lip. The hidden spider orchid flower is similar in appearance to the other spider orchids and resembles the pointed flowers of *C. rivularis* and *C. acuminatus*. The flowers are almost transparent and the long filamentous petals are usually straight. The hood has an elongated point and arches over a broad whiskery-edged lip. The red streaks on the flower concentrate at the base of the lip but are otherwise uniform over petals, lip and stem. The flower stem is short and as the rhizome is buried beneath fresh leaf litter each year the flower usually opens below ground level. After pollination the stem elongates to hold the seed capsule up to 15 cm above the ground for wind dispersal of the seed. The hidden spider orchid flowers in late winter and spring with peak flowering period probably in October.

The hidden spider orchid has not been recorded on the central volcanic plateau although numerous typical habitats exist and it may only require a deliberate search to find them. Elsewhere they have been found under Beech forest and other native forest including Manuka and Kanuka.



Corybas cryptanthus

The Easter Orchid.

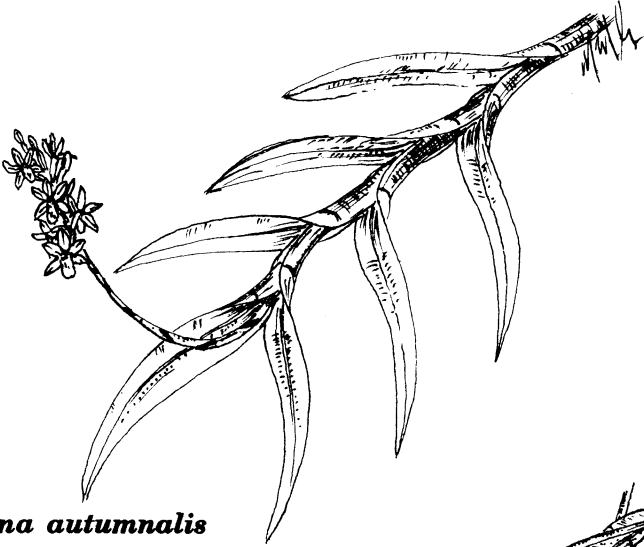
There are several species of perching orchids in New Zealand and the most common of these are *Earinas*. This group of native orchids can tolerate high light levels and hence are found on the branches of trees or on lightly shaded rocks and cliffs. There are two species of *Earina* in New Zealand - the Easter orchid, *Earina autumnalis*, which the Maoris called Raupeka, and the sharp pointed Earina or grass-leaf orchid, *Earina mucronata*, which the Maoris called Peka-a-waka. They are found throughout New Zealand but often confused with the trailing fern *Asplenium* sp.

Perching orchids are not parasitic and merely use the tree branch as a platform on which to grow above the ferns and scrub on the ground. In both species the leaf stems hang down and are produced from a mat of fleshy white roots which anchor the plant to the tree or rock on which it is growing. The roots like to be well drained and the plants can tolerate quite long periods without rain provided they receive mist or dew occasionally. The roots trap dust and provide a habitat for small ferns and moss which in turn hold moisture around the roots preventing them from drying out completely in summer.

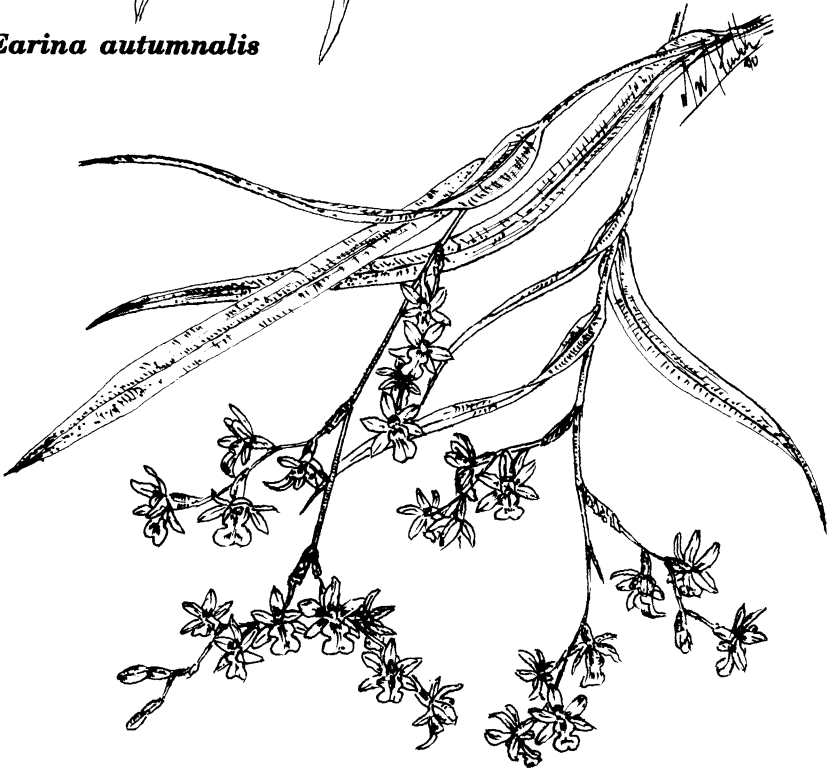
In both species the leaves alternate from each side of the stem which is entirely enclosed within the stiff leaf sheaths. The leaf stem varies in length from 15 cm to more than a metre on different plants. The flower spike is produced from the tip of the stem. The leaves of the Easter orchid are short, broad and held away at a sharp angle from the stem. The leaf sheaths are pale green and often split open. The flower spike is curled upwards and carries about 20 closely packed, small white waxy flowers which are highly perfumed. It is often this perfume which indicates the presence of the Easter orchid in the area. Peak flowering period is in March and April which is about Easter and gives the orchid its common name.

In contrast the grass-leaf orchid has longer slender pointed leaves which do not point away from the stem. The leaf sheaths are pale brown with dark spots. In mass the leaves look like grass. The flower spike hangs downwards and carries 10 to 15 well spaced yellow or orange flowers which have little perfume. Peak flowering period is usually about Christmas but can extend from November to February.

Both species are common around Taupo and are usually found on rocky cliffs rather than trees. Some patches of these orchids cover many square metres and they can be found at the lake edge with their leaves in the water at high lake level. Clumps of these orchids can also be seen growing on the rock walls below the foot bridge at Huka Falls.



Earina autumnalis



The Ladies' Slipper Orchid.

The largest of New Zealand's perching orchids is the ladies' slipper orchid, *Dendrobium cunninghamii*, which has the Maori name Winika. Although there are more than 1000 known species of *Dendrobium* orchids worldwide, New Zealand has only one which is endemic. The ladies' slipper orchid is very hardy and wide ranging, occurring throughout New Zealand from sea level to the mountains but is more common in the lowland forests. Although the botanical name *Dendrobium* means *tree life* or living in trees, the ladies' slipper orchid is often found growing on rocky cliffs or directly in the ground where it has fallen from a tree.

The ladies' slipper orchid is characterised by its long curling branched, yellow-orange canes which grow from a central runner anchored to the tree or rocks by a mat of fleshy roots. Each cane can grow to more than a metre in length with numerous branches along its length. The leaves are small - about 5 cm long, narrow and pointed. The plant produces flowers each year from the same cane with one or two flowers on a stem from the previous seasons growth at the end of each branch. The flower is about 2 cm across, mainly white and star-shaped with a broad pointed lip. The lip has prominent ridges and two red or purple lobes near the throat. Colour variations occur and flowers with pale green lobes or purple-red throats have been found. There is also a variation in the size of the plant with apparently mature flowering plants having very fine canes less than 20 cm long but normal sized flowers. The flower is insect pollinated and sets seed readily. Peak flowering period is December and January with large plants carrying masses of flowers.

The ladies' slipper orchid can be found throughout the central volcanic plateau although it is not always easy to see. Around Taupo the orchid is mainly the form with small canes and grows in the forks of tree branches or on top of the branches high in tall native trees. The small wispy plants are almost invisible from the ground until the cascade of flowers in summer mark the plants. The orchid can also be found growing on the rocky cliffs overhanging the lake but is often mistaken for grass or the Easter orchid. The larger caned form is more common further north and it can be found growing almost in the water around the Rotorua lakes on the mature Pohutukawa trees.



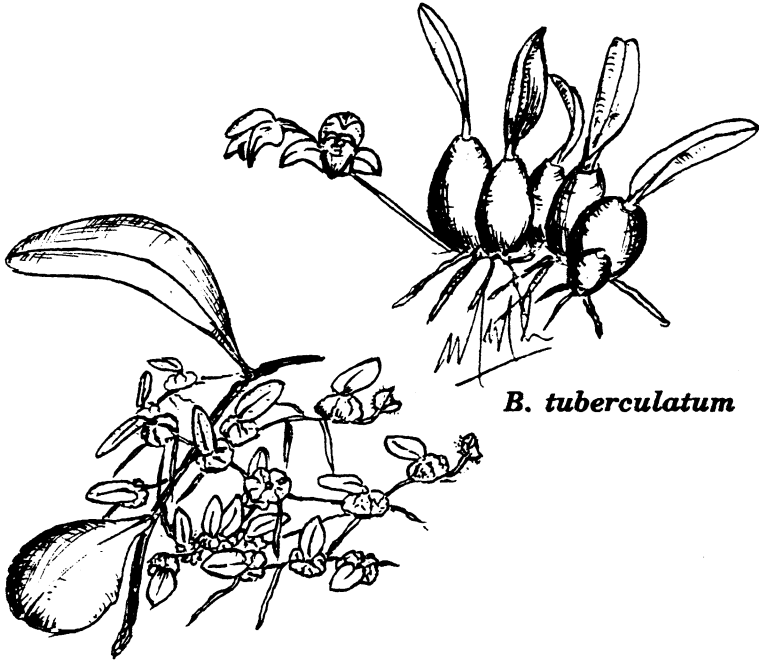
Dendrobium cunninghamii

The Bulb Leaf Orchid.

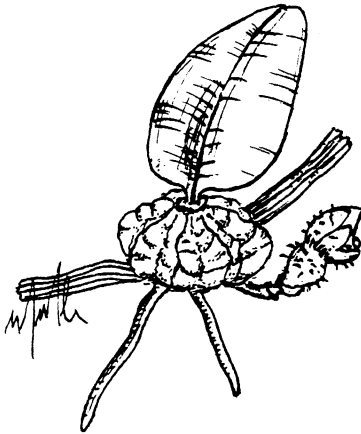
The native orchids of New Zealand are generally smaller than native orchids in other countries and our smallest is one of the smallest orchids in the world. This tiny orchid is the bulb leaf orchid, *Bulbophyllum pygmaeum*, which the Maoris called Piripiri because of its clinging growth habit and appearance. Although belonging to one of the largest orchid genera with more than a 1000 species world wide, only two species are known to occur in New Zealand. Bulb leaf orchids are perching orchids and these plants can be found on trees near eye level where they are easily seen but not necessarily noticed.

The bulb leaf orchid grows from a fine but stiff runner which has few fleshy roots to anchor the plant to the tree support and hence the plant is commonly found growing between the roots of other perching orchids and ferns (particularly the creeping fern *Pyrrhosia serpens*), and in patches of lichens and moss. The plant produces a single leaf less than 0.5 cm long from the centre of a small flattened yellow-green bulb and hence the common name. The bulbs (or pseudobulbs) are supported directly on the runner at intervals of about 1 cm. They are hairless, wrinkled and about the size of the common biddi biddi seed. Colonies of bulb leaf orchids form compact but loose mats on tree branches and sometimes rocks with the stiff runner often holding several plants above the rest of the colony. The single flower is even smaller than the bulb being about the size of a dress-maker's glass head pin. The flower is produced from the base of the bulb on a short hairy stem and is greenish-white in colour. It barely opens and is almost certainly self fertilising as the plants readily set seed. Peak flowering period is December and January.

The bulb leaf orchid occurs locally throughout New Zealand mainly in the tops of lowland forest trees but also at lower levels in northern parts of the North Island. Although not reported from around Lake Taupo it can be found around the Rotorua lakes often growing through the roots of the ladies' slipper orchid. *Bulbophyllum pygmaeum* is more common than the larger species, *Bulbophyllum tuberculatum* which is generally regarded as being rare and only found in a few locations in the North Island and the northern part of the South Island. This species is about three times the size of *B. pygmaeum* and has longer upright leaves from smooth pear-shaped bulbs which are usually packed together in tight clusters. The flower spike is longer, hairless and supports several tiny white flowers which have triangular petals and a showy red lip. This species is darker green in colour and the seed capsules are almost black. It flowers in autumn with peak flowering period in April and May.



B. tuberculatum



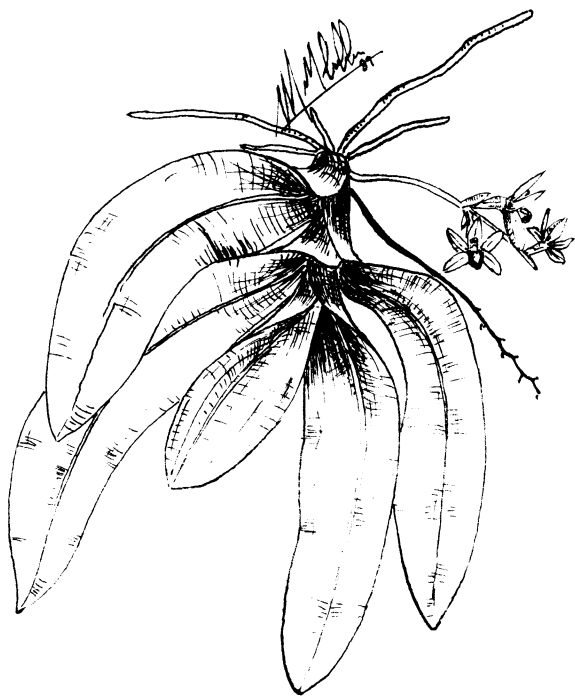
Bulbophyllum pygmaeum

The Green Fleshy Orchid.

In appearance the green fleshy orchid, *Drymoanthus adversus*, looks more like an exotic cultivated orchid than any other New Zealand native orchid. It closely resembles the Australian orchid family *Sarcochilus* and it was originally placed in that genus. In 1967 an Australian orchidologist, Alick Dockrill, transferred it to the present genus as a single species endemic to New Zealand. The green fleshy orchid is found throughout New Zealand including Stewart Island and the Chathams. It is commonly a lowland forest orchid and is another of New Zealand's perching orchids.

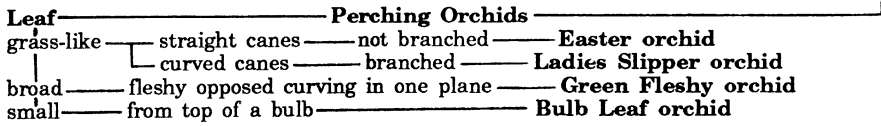
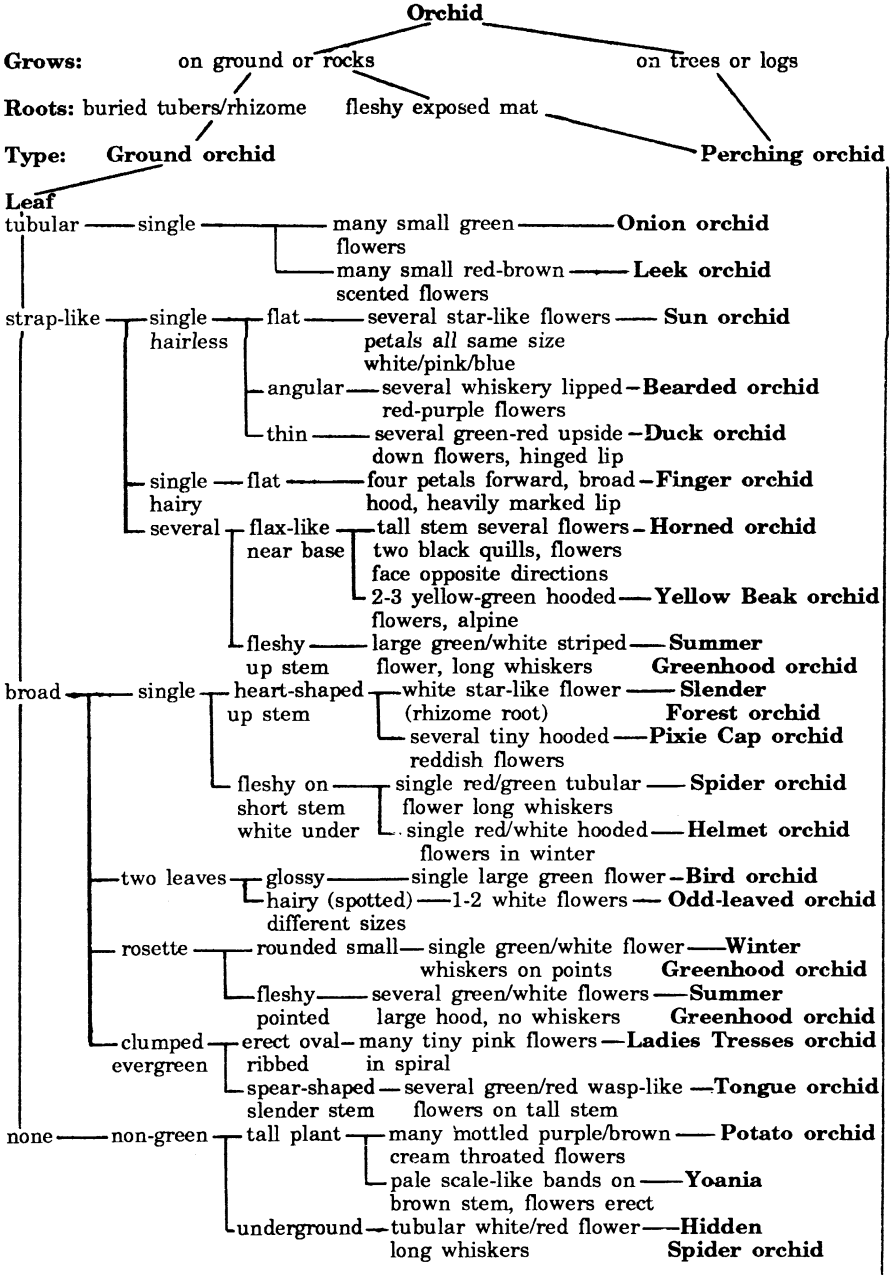
The green fleshy orchid is evergreen and is usually found clinging to the branches and trunks of trees by a wide-spreading mat of flattened grey or green roots. The plant produces a growth consisting of a series of opposing broad curving leaves all lying in one plane which gives the plant a flattened horse-shoe shape. The leaves which are about 5 cm long are usually green or yellow-green and fleshy although they can tend to be leathery. The leaf has a pronounced channel in the centre and the sheath at the base of the leaf wraps around the plant stem. Flower stems are produced in spring from between or below the leaves and not the growing tip of the plant. The flower stem is about 5 cm long and carries a cluster of up to 15 tiny flowers. Each flower is about 0.5 cm long but opens wide to about 1.5 cm across. The hood and petals are broad and pointed. They are almost transparent, green-white with red flecks. The red flecking extends to the fleshy yellow cup-shaped lip and the flower stem itself. The flowers set seed readily and the large seed capsules stay on the plant for a long time before opening. The older flower stems remain on the plant for several years. The green fleshy orchid flowers in spring and early summer with peak flowering period in October and November.

The green fleshy orchid plant is a single growth of leaves but colonies of these orchids growing together with roots intertwined look to have numerous growths and cover large areas on the tree trunk or branch. The usual habitat is near the base of trees or on rocks in moist areas particularly gullies. Plants are also reported from high in tree tops or on branches that have fallen from tall trees. There does not appear to be any preference for support tree and the orchid can be found on a wide variety of trees including introduced willows and lowland shrubs. The key to the habitat is the moist environment found in the forest or misty gullies and without this moist habitat the orchid dies. Around the central volcanic plateau the green fleshy orchid has been found in the Pureora Forest and further east in the Urewera Forest. Although regarded as a single species recent finds of a spotted leaved form have raised the possibility of there being two species.



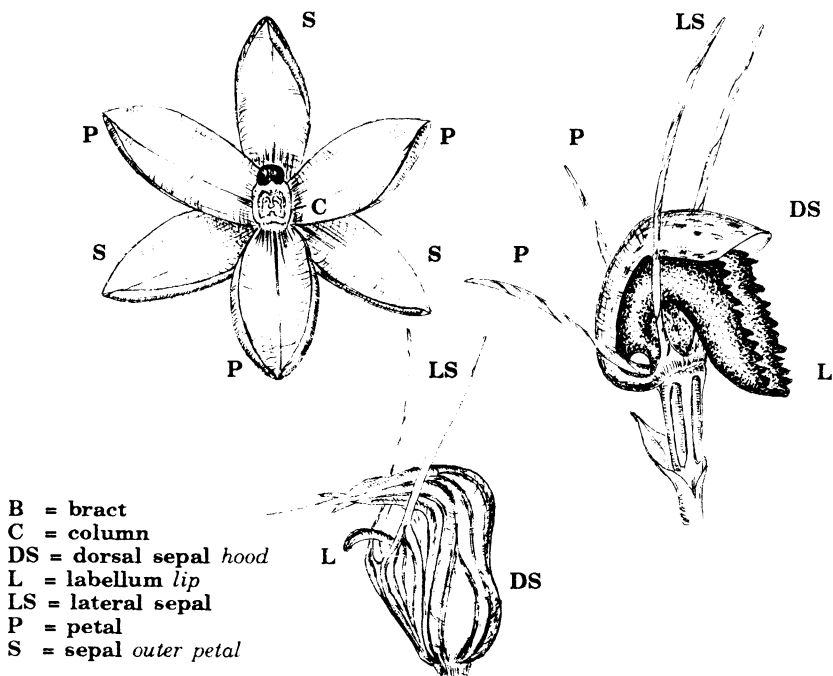
Drymoanthus adversus

Quick identification guide



For simplicity, the native orchid flowers have been described only in terms of petals, lip and column. This is not technically correct as the three outer 'petals' are actually sepals which cover the petals when the flower is a bud or closed. The column in the orchid flower is the combined anther and pistil of other flowers. The pollen is carried on the outer end of the column and is separated from the stigmatic surface by a small ridge. In some native orchids this ridge is easily bridged and the flower is self pollinating.

All orchid flowers have three sepals and three petals but these may be highly ornamental in shape. The sun orchid is unusual in that all the sepals and petals are of similar size and shape making it difficult to determine the orientation of the flower. In all other orchids, the sepals are a different shape to the petals. The top of the flower is formed by the dorsal sepal which is usually hood-shaped and arches over the flower. The lip or labellum is actually a modified petal and is at the bottom of the flower. The lip acts as a guide to the column for the pollinators and is usually larger than the other petals with specialised markings and lumps. The lumps are known as calli. Some orchid flowers are 'upside down' so that the lip is at the top and the hood points down.



Common name	Genus	No	Species	Flowers
Bearded	<i>Calochilus</i>	3	<i>C. herbaceus</i> r, <i>C. paludosus</i> r <i>C. robertsonii</i> r	Nov-Dec
Bird	<i>Chiloglottis</i>	3	<i>C. cornuta</i> , <i>C. formicifera</i> ? <i>C. gunnii</i> r	Nov-Dec
Bulb Leaf	<i>Bulbophyllum</i>	2	<i>B. pygmaeum</i> , <i>B. tuberculatum</i> r	Dec-Jan
Duck	<i>Caleana</i>	1	<i>C. minor</i> r	Nov-Dec
Easter	<i>Earina</i>	2	<i>E. autumnalus</i> e <i>E. mucronata</i> e	Mar-Apr Dec-Jan
Finger	<i>Caladenia</i>	3+	<i>C. catenata</i> , <i>C. iridescens</i> <i>C. lyallii</i>	Dec
Gnat	<i>Cyrtostylis</i>	1	<i>C. reniformis</i>	Aug-Sep
Green Fleshy	<i>Drymoanthus</i>	1	<i>D. adversus</i> e	Oct-Nov
Helmet	<i>Corybas</i>	2	<i>C. cheesemani</i> , <i>C. unguiculatus</i> ?	May-Jun
Hidden Spider	<i>Corybas</i>	1	<i>C. cryptanthus</i> u,e	Sep-Oct
Horned	<i>Orthoceras</i>	1	<i>O. strictum</i>	Jan-Feb
Ladies' Slipper	<i>Dendrobium</i>	1	<i>D. cunninghamii</i> e	Dec-Jan
Ladies' Tresses	<i>Spiranthes</i>	1	<i>S. sinensis</i>	Feb
Leek	<i>Prasophyllum</i>	4	<i>P. colensoi</i> , <i>P. nudum</i> <i>P. patens</i> , <i>P. pumilum</i> e	Nov-Jan
Odd-leaved	<i>Aporostylis</i>	1	<i>A. bifolia</i> e	Dec-Jan
Onion	<i>Microtis</i>	3	<i>M. oligantha</i> e, <i>M. parviflora</i> r <i>M. unifolia</i>	Nov-Jan
Pixie Cap	<i>Acianthus</i>	2	<i>A. sinclairii</i> <i>A. viridis</i>	Jun-Aug Nov-Dec
Potato	<i>Gastrodia</i>	3	<i>G. cunninghamii</i> e, <i>G. minor</i> e <i>G. sesamoides</i>	Dec
Slender Forest Spider	<i>Adenochilus</i>	1	<i>A. gracilis</i> e	Dec
	<i>Corybas</i>	6+	<i>C. acuminatus</i> e, <i>C. macranthus</i> <i>C. oblongus</i> e, <i>C. rivularis</i> e <i>C. orbiculatus</i> e, <i>C. trilobus</i> e	Oct-Nov
Summer Greenhoods	<i>Pterostylis</i>	22+	<i>P. areolata</i> e, <i>P. banksii</i> e, <i>P. cardiostigma</i> e, <i>P. foliata</i> , <i>P. graminea</i> e, <i>P. irsoniana</i> e, <i>P. oliveri</i> e, <i>P. montana</i> e, <i>P. nutans</i> r, <i>P. patens</i> e, <i>P. plumosa</i> u, <i>P. tristis</i> u	Oct-Dec
Sun	<i>Thelymitra</i>	12+	<i>T. longifolia</i> (white) <i>T. carnea</i> , <i>T. pauciflora</i> (pink blue) <i>T. decora</i> , <i>T. ixioides</i> (blue spots) <i>T. dentata</i> e, <i>T. pulchella</i> e, <i>T. venosa</i> (blue striped)	Dec-Jan
Tongue	<i>Cryptostylis</i>	1	<i>C. subulata</i>	Dec-Jan
Winter Greenhoods	<i>Pterostylis</i>	3	<i>P. alobula</i> e, <i>P. brumalis</i> e, <i>P. trullifolia</i> e	May-Jul
Yellow Beak	<i>Lyperanthus</i>	1	<i>L. antarcticus</i> e	Dec-Jan
Yuania	<i>Yoania</i>	1	<i>Y. australis</i> e	Dec-Jan

e = endemic to NZ; r = rare; u = uncommon; ? = possibly extinct

Not all species are listed and the current review of New Zealand's native orchids will undoubtedly expand the list as the newly found species are included and others are renamed. Flowering times are about the peak period and may extend earlier or later depending on local conditions.

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