



*Pterostylis irwinii* DL Jones, Molloy & MA Clem. 1997

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*Pterostylis irwinii*



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## From the editor

### Bruce Irwin honoured

Our cover is *Pterostylis irwinii* (see "Notes" in this issue). David Jones, Brian Molloy and Mark Clements write, "The specific epithet honours J.B. (Bruce) Irwin for his outstanding contribution to the knowledge and illustration of New Zealand orchids, and who discovered this species during his orchid explorations of the Central North Island [1]." This is the species tagnamed *P. "Erua"*.

Members of the Group were also delighted to hear that Bruce had been recognised by the presentation of the John Easton Award in 1997. The award is made annually by the Hawke's Bay Orchid Society for the most outstanding contribution to the culture and promotion of orchids in New Zealand; this is the first time it has been won for work with native orchids. We are grateful to Beryl Goodger who wrote the following citation for the Award:

"Bruce Irwin has had a lifelong interest in New Zealand native orchids and from his earliest working days in New Plymouth, he drew and painted the orchids he found, for his own interest.

"The botanist Dr Lucy Moore was impressed by his watercolours and this led to Bruce collaborating with her on a major paper in the *Journal of Botany* and subsequently *Flora of New Zealand* Vol. 2 (published 1970), in which he illustrated the section on orchids. When Dr Moore was



asked to write the *Oxford book of New Zealand plants*, Bruce was her immediate choice as illustrator. This book took him eleven years — he was by now doing enlarged drawings using a binocular zoom microscope, with meticulous attention to detail, and this was published in 1973. He also worked part-time in the Art Department of Otago Medical School from 1967 to 1979, after which he retired to Tauranga. Now he was able to spend more time in the field looking for native orchids and drawing them. As he became known, others would send plants to him for identification. He would draw many of these too and thus became busier than ever.

"In 1947 Owen Gibson discovered a new species of *Pterostylis* on Mt Egmont, Bruce drew it and in 1950 E.D.Hatch described *P. irsoniana* naming it for the two men. Near Wellsford, Bruce and Owen also discovered *Corybas cryptanthus*, our almost completely subterranean orchid. Bruce has continued to add to our knowledge of our native orchids by research into the structure, habitat and habits of the plants, and his drawings have clarified many finer points and differences among species. His drawings are always absolutely true to scale and show internal sections and cross sections.

"Those attending the Taupo Orchid Society and N.Z. Native Orchid Group weekends at Iwitahi have benefited greatly from his fund of knowledge and appreciated his dry sense of humour.

"His writings and drawings have appeared in the *NZ Native Orchid Group Journal*, the booklet *The N.Z. orchids: natural history*

and cultivation, and Botanical Society publications. His illustrations have accompanied official descriptions of new species *Drymoanthus flavus* (St. George et Molloy).

"Bruce Irwin has done much research and field work in untangling the group of orchids *Corybas rivularis* and closely related species. The importance of this was recognised by the Wellington Botanical Society one year by awarding him a grant towards expenses.

"Bruce has separated out at least five species formerly lumped together as *C. rivularis* and as a result, some of these have been (or are in the process of being) officially named. The rest bear tagnames at present. Ian St. George, editor of the *NZNOG Journal* writes 'I believe this will be seen as the most important of his many contributions to N.Z. orchidology — the differentiation of the various forms of *Corybas rivularis*'.

"On coming to live in Tauranga, Bruce joined the Bay of Plenty Orchid Society, and when Tauranga Orchid Society was formed in 1981 he became a foundation member. He was made a life member of the Tauranga Orchid Society in 1994.

"Bruce grows a variety of orchids but his main interest among the exotics is *Paphiopedilum* species and primary hybrids. He grows these well and his *Paph. parishii* X *roebelinii* was judged as show champion at the 1995 Bay of Plenty Autumn Show.

"Bruce designed the club badges for the Tauranga Orchid Society, the N.Z. Native Orchid Group and the Odontoglossum Group. He has also illustrated cards with orchids owned by Tauranga society members. Bruce has designed and helped build the Tauranga Orchid Society stands for the 1985 International Conference in Wellington (large trees), the 13th World Conference in Auckland, 1990 (some very large realistic

rocks with a pond and rice stamper) and also for the Orchid Expo in Palmerston North 1995. The design for the last, which had to fit a difficult site, was a Pre-Inca temple with carved panels (and guarded by 2 large jaguar) which made an excellent setting for the orchids displayed by the society. This was rewarded by the display winning the open section for displays larger than 18sq.m. and being named the overall Champion Display at the Expo.

"Though of a quiet and retiring disposition, Bruce has always been willing to share his expertise with others, without pushing himself forward. He is well thought of by all and we are pleased that he chose Tauranga for his retirement."

#### Reference

1. Jones DL, Molloy BPJ, Clements MA. Six new species of *Pterostylis* R.Br. (Orchidaceae) from New Zealand. *The Orchadian* 1997; 12 (6): 266-281.

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## Orchids and fungi

Sentences like "In vesicular-orbuscular mycorrhizas, the mycobiont undergoes pronounced alterations in morphogenesis involving appressorium formation, (and) arbuscule development..." leave the amateur gasping for breath. This is a complex subject with its own expert language: fortunately writers like Warcup and Perkins from Australia demonstrate the ability to convey complex information simply.

### Fungi

What is a fungus? We think of toadstools, bracket fungi, ringworm, athlete's foot — they are all fungi. The fungi are called Mycota, about 50,000 species described, including mushrooms, yeasts, rusts, smuts,

mildews and molds. The mushroom we eat is the fruit (also known as the "perfect state") of a larger organism, which has hollow branched filaments called hyphae that form networks in the soil; the bracket fungus we see is the fruit of a larger organism whose hyphae thread the dead bark and wood of the tree. Ringworm is the infection of the human skin by similar organisms; if you scrape the skin cells and look at them under the microscope you can see fungal hyphae.

The study of fungi is mycology, and many words referring to fungi have "myc-" in them. Mycoses are fungal diseases; *ascomycetes* are a genus of fungi, *Mycetophilidae* are the fungus-loving gnats.

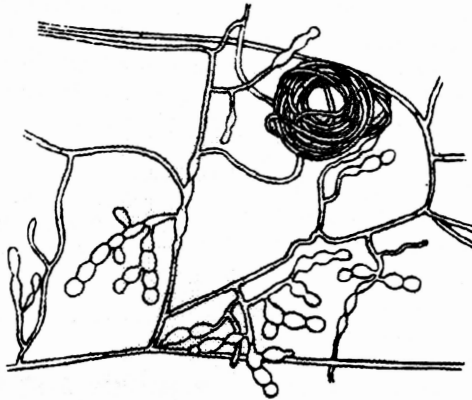
Medical mycologists identify pathogenic fungi by their asexual spores; plant mycologists may deal with fungi that develop perfect states — the fruit that contain sexual spores — and use these for identification. Where perfect states cannot be achieved in cultivation, the structure of the hyphae, the pattern of branching and rejoining of hyphae (anastomosis), or the number of nuclei in cells may give a clue as to identity.

### Mycorrhizas

If you read about orchids you can't escape phrases like "fungal associations", and "pine needle layer rich in fungal hyphae". In fact the roots of most vascular plants have evolved in association with soil fungi. The

resulting combined structures are called mycorrhizas ("fungus-roots"). There are seven main kinds of mycorrhizas, the four most carefully studied involving crop plants, forest trees, heaths and orchids [1].

Many orchid mycorrhizal fungi belong to the form genera *Rhizoctonia*, *Epulorrhiza*, or *Ceratorrhiza*. These same genera may contain species that are orchid pathogens, form associations with other plants, or have no plant associations.



The orchid fungus *Rhizoctonia repens* - [4]

The habitat of the fungus may determine the habitat of the orchid — thus the fungus *Rhizoctonia borealis* requires acid soils under conifers, so that is where its associated European orchids *Spiranthes gracilis* and *Goodyera repens* are found.

Strictly, the term mycorrhiza should apply only to the fungus/root association, but it is loosely applied also to the association between the fungus and the developing orchid protocorm (the stage between seed and embryo).

### Orchid mycorrhizas

Orchids require the relationship with a fungus for their existence. The importance differs among species, the "infection" by the fungus being heaviest in temperate terrestrials, but light in tropical epiphytes. The relationship is essential for the germination of the seed of all orchids in the wild, and remains essential for a few species throughout life.

### Seeds, protocorms and fungi

Orchid seeds are tiny and lack the built-in nutrition of bigger seeds; orchids then pass through a nongreen ("achlorophyllous") developmental stage when they cannot use fats, break down starch, obtain phosphates or photosynthesise, and therefore rely on an external source. This is provided either by man in the form of simple carbon-containing foods in sterile seed germination, or by a fungus which breaks down complex compounds into simpler ones in symbiotic germination. The fungal hyphae penetrate via the base end of the seed. The hyphae enter the cells and coil into structures called pelotons. Germination of the seed into a protocorm follows. The cells eventually digest the pelotons, but occasionally the fungi become parasitic and destroy the protocorm.

### Roots and fungi

In some species (*Gastrodia*, *Danhatchia* and *Corybas cryptanthus* in New Zealand) chlorophyll never does develop, so the orchids rely for all their lives on associations with fungi. In others, the leaf-size is too small to support the rest of the orchid, and the orchid continues to rely partly on the fungus for its nutrition (*Corybas cheesemanii* for instance); such plants have been called saprophytic, but that is an incorrect application of the term. Some plants of the European *Spiranthes spiralis* pass alternate seasons underground, apparently fully nourished by their fungus during that time; some NZ orchids do not appear above ground every year and may do the same.

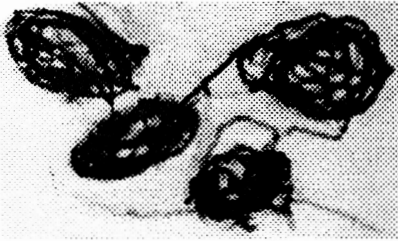
Most terrestrials seem to thrive better in

the wild than in pots (some cannot be cultivated "artificially" at all), probably because they must have access to at least some of their nutrition via their fungal association.

In different terrestrial orchids the fungi penetrate the stems, tubers or root hairs, via epidermal ("skin") cells after hyphae have spread over the root surface [2]. Pelotons are formed, and eventually digested.

"Symbiosis" suggests mutual benefit, and indeed *Cymbidium* and its fungus each require the vitamin thiamine, made up of thiazole and pyridine; the fungus supplies the thiazole and the orchid supplies the

pyridine [3]. Most orchid-associated fungi can, however, live without the orchid, and it seems that whereas the fungus supplies the orchid with a range of nutrients and stimuli, the orchid usually provides little in return. Many orchids have



Pelotons photographed from a squashed preparation of a *Goodyera repens* rhizome - [4]

"host" cells that store fungus, and adjacent digestion cells that break the fungus down by means of substances known as phytoalexins. The partnership between orchid and fungus has been called symbiosis (a "win-win situation" as the politicians say in Wellington these days), or a "delicately balanced mutual antagonism" [4], or plain parasitism (of the orchid on the fungus, that is).

Fungi that are apparently symbiotic can turn nasty and attack the orchid; furthermore the fungi of epiphytes may invade the orchid's host tree to the tree's (and ultimately the orchid's) detriment.

### Specificity

Some studies in the laboratory suggest that

specific orchids require specific fungi, but few associations have been studied in the wild, fungi are difficult to isolate and difficult to grow (especially to the usually readily identifiable perfect state), and even in one orchid species, the fungus required by the protocorm may be different from that required by the adult. Certainly some orchids can establish successful relations with several different fungi.

Perkins has looked at the Australian orchids *Pterostylis acuminata* and *Microtis parviflora* in the wild and in the laboratory [19, 20]. Whereas only a few species of fungi were associated in the wild, several more would form associations in the laboratory — thus “ecological specificity” (what happens in the wild) is different from “potential specificity” (what *could* happen if laboratory experiments were to reflect the wild state) [18].

### New Zealand studies

In 1911 Lancaster showed that fungal hyphae do penetrate the root hairs of NZ epiphytes and form pelotons which are digested by the orchid cells [5].

Ella Campbell began a series of papers on the fungal associations of NZ's nongreen orchids in 1962 [6-10]; she showed

- *Gastrodia cunninghamii* is associated

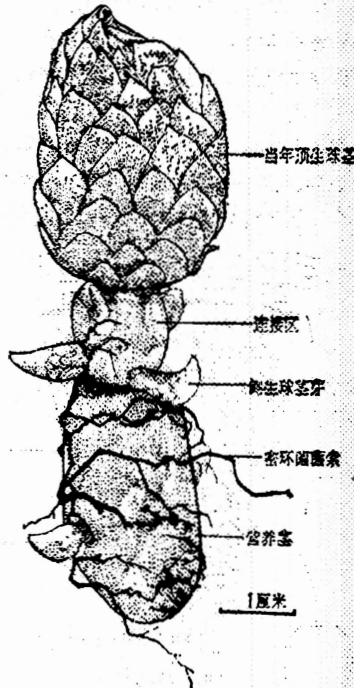
with the fungus *Armillaria mellea* which is itself a parasite on the roots of forest trees [6];

- *G. minor* is associated with and derives nutrients from an unidentified fungus which also penetrates the roots of adjacent manuka [7];
- What is probably the bracket fungus *Fomes mastoporos* inhabits the roots of

*Acacia melanoxylon* and is an endophyte of *Gastrodia* aff. *sesamoides*, which digests it [8];

- All around the roots of taraire trees grow the hyphae of the puffball fungus *Lycoperdon perlatum*, and these hyphae form a network around and attach to the rhizomes of *Danhatchia australis*, invade the tips of root hairs, and are digested by the cells of the orchid. The orchid is parasitic on the fungus, which in turn derives nutrients from, and may damage, the roots of the taraire [9].

- *Corybas cryptanthus* has an associated unidentified fungus that invades the roots through root hairs attached at tiny conical projections; the fungus spreads among the beech leaf litter, and is a weak parasite on the *Nothofagus* [10].



Drawing of a young *Gastrodia* plant showing the net of fungal strands around the developing tuber. From a Chinese book.

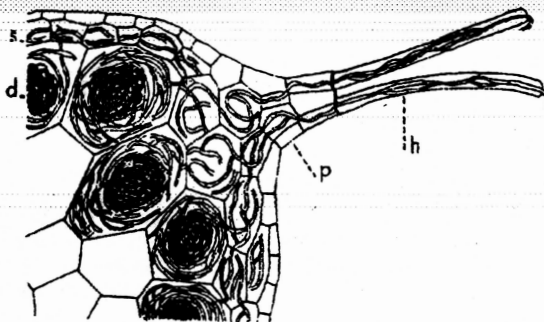
### Australian work

J.H. Warcup, M. Clements, K. Dixon and A. Perkins and their co-workers have been the major contributors to the study of Australian orchid/fungus relationships [2, 11-21]. Readers interested in delving deeper are

referred to these authors (for instance Warcup [16] gives an excellent general overview of the fungal relationships of South Australian orchids). Here are a few snippets.

- Warcup and Talbot seem to have had a genius for inducing orchid fungi to fruit in culture. They grew fungi from pelotons teased from the cells of Australian native orchids — of 102 isolates from 25 orchid species 66 fungi were induced to fruit. Fungal species of the following genera formed mycorrhizal associations with orchid species (of the genera in brackets): *Thanatophorous* (*Acianthus*, *Thelymitra*), *Ceratobasidium* (*Pterostylis*, *Prasophyllum*, *Acianthus*), *Tulasnella* (*Diuris*, *Acianthus*, *Thelymitra*, *Caladenia*, *Cymbidium*, *Dendrobium*) and *Sebacina* (*Acianthus*, *Caladenia*, *Glossodia*, *Microtis*); the same fungal species often formed mycorrhizal associations with European orchid species. These truly intracellular fungi were often different from those found on the surface of orchid roots [12].
- Fire affected the abundance, behaviour and composition of fungus infecting West Australian orchids; there were six categories of fungus, and each was specific and consistent within species and within most genera; the rare and related *Drakaea*, *Paracaleana* and *Spiculaea* had a unique and culturally distinct fungus noted for its intense violet-pink colour [2].

- Initial contact between fungus and seed is haphazard — there is no evidence that an attractant is used by the orchid seed. Seeds appeared to resist entry by incompatible fungi, while allowing the entry of compatible fungi. There was a strong specificity of fungus for each orchid studied. Pelotons appeared about a week after initial infection in some cells and signified a compatible orchid/fungus match that would lead to germination. The protocorm seemed to have



Part of a cross-section of a *Corybas cryptanthus* rhizome. d = digestion layer with pelotons; h = hair - [10].

entry, holding and digestion zones for the fungus, though the way the fungus is controlled in these zones is unknown. Failure of germination was caused by fungal hyphae failing

to penetrate the seed, or by penetrating all the embryo's cells resulting in death of the embryo [21].

- In *Pterostylis* the fungi can be grouped, and where the groups are found is determined by the environment. One fungus, for instance, was found only under *Pinus radiata*. Geographic distribution (and perhaps some aspects of habitus?) of orchid species may thus be determined by fungal ecology [17].
- Perkins and co-workers found only two fungi associated with *Microtis parviflora* in the wild, and the same two in protocorms: they concluded that the adult roots associate with a narrow range of fungi in the field (have a nar-



row ecological specificity) and these associations are established in the protocorm. On the other hand, many fungi were able to form associations with *M. parviflora* in the laboratory, indicating a broad potential specificity [19]

- It would seem logical that the germination of orchid seed in the wild should depend on the amount of fungus in the soil, but this may not be so. Perkins and co-workers studied *Pterostylis acuminata* and its fungal associations: this orchid appears to associate with only one specific fungus, a subspecies of *Rhizoctonia solani*. Furthermore this orchid reproduces asexually (i.e. essentially by cloning). The orchid and the fungus may therefore be co-distributed, and if an orchid is able to establish at a new site, the resultant increase in the associated fungus may favour further spread of the orchid. There are implications here for the resiting of rare orchids — if there is a single fungus associated with the orchid, a new site will need to be apt for the fungus as well as for the orchid: if the fungus does not survive, neither will the orchid [20].

Orchids that form ecologically specific relationships with single pollinating insects can only survive in the presence of that specific insect. We now see that there are orchids which form ecologically specific relationships with single mycorrhizal fungi: they can only survive in the presence of that specific fungus.

How these observations apply to the New Zealand species is open to speculation.

#### Acknowledgements

I am grateful to Dr AJ Perkins for supplying a list of Australasian papers.

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## British orchid genera: 3: *Cypripedium*

The second of July last year dawned dull in Switzerland, and it grew more so on the road from Interlaken up to Lauterbrunnen, that tourist destination for views of the majestic Eiger, Munch and Jungfrau, and for a network of walking tracks among meadows of alpine flowers.

This was an important pilgrimage. "Drive to Lauterbrunnen," my advisor had said, "take the funicular train through Wengen to Wengenalp, walk to Biglenalp, then go down across the stream by the cattle bridge, up between the two cowsheds, down through the conifer woods, and out onto the flat below the Eiger. Walk towards the glacier. You can't miss them."

The carpark was miles from the station; when we eventually caught the train we shared our carriage with a very loud American family; and now it rained; we caught only rare glimpses of the mountains, and after Wengenalp we were soon soaked to the skin; we missed a turn and walked too far in the wrong direction. A kind Scots couple pointed us back to where we should have been. The little stream was roaring and the cattle bridge was slippery.

The cows tossed and flicked at the pestering insects though and the hills were alive

with the music of their bells. *Coralorrhiza trifida*, a saprophytic orchid, was abundant under the fir trees. The trees thinned and suddenly we were out in the open; grassy slopes led to snow-covered shingle fanning out from the precipitous base of the mountains looming in the mist above us.

This was it. The end of the pilgrimage. And yes! there they were!

In days of old when gods and goddesses walked the earth, Venus was strolling through a forest when a sudden thunderstorm surprised her. The next day a young shepherdess, leading her flocks through woods to the pastures beyond, saw the exquisite little shoe and ran to pick it up. But as she reached for it the treasure vanished and left in its place a flower in the shape of a slipper [1].

The *Sabot de Venus*, the *Frauenschuh*, the Lady's Slipper.

*Cypripedium calceolus* is protected vigorously by the Swiss, who now boast good numbers of relatively accessible plants.

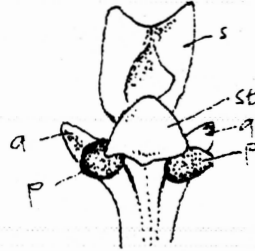
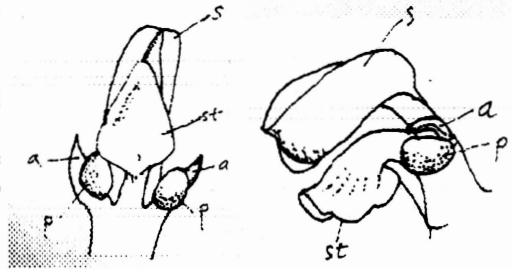
The Slipper Orchids comprise five genera, and can be considered to be primitive orchids, not yet fully evolved from lilies. There is a single stalked stigma, but three stamens — two fertile anthers and an infertile staminode that has evolved into a petaloid structure providing extra protection for the reproductive parts.

The dorsal sepal of *C. calceolus* is broad,

arching over the column; the lateral sepals are fused, the petals twisted ribbons to either side. The labellum is a deep slipper, the sides so smooth that an insect, attracted by the colour and by the delicate perfume, falls in and can only escape by climbing the stiff hairs inside the base of the labellum, so coming into contact with the pollen.

**Reference**

1. Davies P. & J. Huxley A. *Wild orchids of Britain and Europe*. Chatto & Windus, London, 1984.



**The column**

from beneath ↑  
from the side ↗  
from in front →

*a* = anther;  
*p* = pollen mass;  
*s* = staminode;  
*st* = stigma



*Cyripedium  
calceolus,*

Biglenalp, Switzerland, July 1997

## Original papers

### The New Zealand genera 3 — the endemic genera

by E.D. Hatch, Laingholm, Auckland

Five genera, *Aporostylis* in the Australian subtribe *Caladeniinae*; *Danhatchia* in the Asian subtribe *Goodyerinae*; *Earina* in the Asian subtribe *Glomerinae*; *Waireia* allied to the Australian subtribe *Caladeniinae*; and *Winika* in the Asian subtribe *Dendrobiinae* are endemic in New Zealand. This is a remarkable proportion in an orchid flora of about 100 species, and seems to be due to isolation over a very long period. *Earina* has two closely related species. The other four are monotypic. The New Caledonian and Pacific plants earlier included in *Earina* are now considered to belong in other genera.

1: **Aporostylis** Rüpp & Hatch  
*Proc.Linn.Soc.NSW* 70: p60 (1946).

Name from the Greek, *aporein*, to be uncertain. The confusion over the interpretation of the column. The plant has been assigned to both *Caladenia* and *Chiloglottis*, but doesn't fit in either genus.

**Aporostylis bifolia** (Hook.f) Rüpp & Hatch *ibid.*

Name = two leaved.

**Basionym** — *Caladenia?* *bifolia* Hook.f  
*Flora NZ* 1: p247 (1853).

**Distribution** — North; South; Stewart; Chatham; Antipodes; Auckland; Campbell Is. An alpine/montane species reaching its northern limit on Mount Moehau, in the Coromandel Ranges, and becoming increasingly common as it ranges south, coming down to sea-level in the sub-antarctic islands.

**Type locality** - Otago. Lyall. (K)

**Flowers** — November to February — insect pollinated.

See also the paragraph upholding the validity of *Aporostylis* in the *Botanical Journal of the Linnean Society of London* 114(1):p31 (1994) *Systematic leaf anatomy of Caladeniinae* — A.M. Pridgeon (Kew) p45

'*Aporostylis bifolia* was originally described as *Caladenia bifolia* by J.D. Hooker on the basis of the floral features, transferred to *Chiloglottis* by Schlechter, because of its vegetative similarity to that genus, and then segregated by Rüpp & Hatch, because of its inconsistencies with both genera. Like many species of *Caladenia*, the leaves have glandular trichomes, stomata on both surfaces, and homogeneous mesophyll. However the trichomes of *Aporostylis* are unique among the *Caladeniinae* in being multi-seriate. Furthermore, the mean length/width ratio of its adaxial stomata (0.772) falls far outside the range of other taxa. Pending cladistic analysis, *Aporostylis* may well be a sister taxon to *Caladenia sensu stricto*, diverging early and isolated in New Zealand.'

[Brian Molloy provided the *Aporostylis* material for this study].

2: **Danhatchia** Garay & Christenson  
*Orchadian* 11(10): p469 f. 471 December (1995)

Name = E.D. Hatch

**Danhatchia australis** (Hatch) Garay & Christenson *ibid.*

Name = southern. (It was when the plant was in *Yuania* !)

**Basionym** — *Yoania australis* Hatch  
*Trans.Roy.Soc.NZ. Bot.* 2(14): p185 (1963)

This plant is remarkable for surviving undiscovered until 1955; and for largely lacking chlorophyll and being parasitic on the puffball fungus *Lycoperdon perlatum*, which in its turn grows in mycorrhizal association with the rootlets of the taraire (*Beilschmiedia tarairi*), and/or nikau (*Rhapalostylis sapida*).

**Distribution** — North Id.; from Waipoua southwards to Pirongia Mountain; on the Coromandel peninsula; and on the offshore islands of Great Barrier, Little Barrier, Fanal and Waiheke. South Id.; Kaihoka Lakes Reserve, NW Nelson, with nikau (but not taraire), on old consolidated sand dunes.

**Type locality** — Mount Auckland, Atuanui State Forest, Kaipara. Ross & James Beever 24.12.1962. (Holotype — AK 108769).

**Flowers** — December - February — self pollinated.

**3: Earina** Lindl. *Botanical Register sub* t1699 (1834)

Name = spring — the flowering period of *E.mucronata*.

**Genotype** — *E.mucronata* Lindl. *ibid*.

Epiphytes with creeping, branching rhizomes and long ± pendulous stems. Usually on the trunks and branches of trees but sometimes on rocks and banks. The racemes often persist into the following season and flower again.

**Distribution** — North; South; Stewart and Chatham Is.

**1: Earina autumnalis** (Forst.f.) Hook.f. *Flora NZ* 1: p239 (1853)

Name = autumn — the flowering period.

**Basionym** — *Epidendrum autumnale* Forst.f. *Prodr.* p60 n319 (1786).

Strongly scented. The tips of the stems are

often turned upwards so that the raceme of flowers is erect.

**Type locality** — Dusky Sound, J.R. Forster 28.3.1773. (P).

**Flowers** — March - May — insect pollinated.

Hoare M.E. *Resolution Journal of J.R. Forster* 2:p241 (1982)

‘after dinner I went ashore towards the new watering place in our new anchorage and found a very fine *Epidendrum* in flower, which spread a very agreeable smell’

Bidwill J.C. *Rambles in New Zealand* p67 (1841)

‘Rotorua — March 13 to 21 1839 - ‘I discovered in the woods here...a most beautiful epiphytal orchidaceous plant with a very powerful perfume — [his footnote] probably *Earina mucronata*.’

[The combination of flowering date and perfume suggest that this was in fact *E. autumnalis*. The plant, sent by Bidwill to Lindley, was the basis of his *E. suaveolens*. EDH]

**2: Earina mucronata** Lindl. *ibid*.

Name = the mucronate tips to the leaves.

The stems are compressed and marked with black spots. A robust, summer-flowering, coastal form, particularly abundant in the Chathams, was described by Cheeseman as *E.aestivalis*, but this is now included in *E.mucronata*. First discovered at Whitianga in November 1769, during Cook’s *Endeavour* voyage, this was described by Solander as *Epidendrum mucronatum* —

‘parasitic (actually epiphytic) on trees’, and illustrated by Parkinson. Solander’s Observation — ‘This description of the roots creeping on the bark of the stem and branches of trees will seem incredible.’

**Type locality** — Bay of Islands,

A.Cunningham 1826. (K).

**Flowers** — in the main from September to November, with some plants flowering through the summer — insect pollinated.

4: **Waireia** Jones *et al. Orchadian* 12(6): p282 December (1997)  
Name from the Maori = growing in wet peat

1: **Waireia stenopetala** (Hook.f.) Jones *et al. ibid.*

Name = narrow petals

**Basionym** — *Thelymitra stenopetala* Hook.f. *Flora Antarctica* 1: p69 (1844)

**Syn.** — *Lyperanthus antarcticus* Hook.f. *Flora Antarctica* 2: p544 (1847)

**Distribution** — vide Jones *et al.* 'Southern North Island, western and southern South Island, Stewart, Auckland and Campbell Islands — widespread and locally common'

**Type locality** — Auckland Islands. November 1840, J.D.Hooker #1470 (Lectotype K)

**Flowers** — November - March — self fertile.

5: **Winika** M.Clements *et al. Orchadian* 12 (5): p214 September (1997)  
= the Maori name.

This plant, in the section *Macrocladium*, has always been considered marginal to *Dendrobium*, taxonomically and geographically isolated in New Zealand, and is now satisfactorily treated as a monotypic, endemic genus.

1: **Winika cunninghamii** (Lindl.) M.Clements *et al. ibid.*

Name = Allan Cunningham

**Basionym** — *Dendrobium cunninghamii* Lindl. *Bot.Reg.* 21:sub t1756 (1835)

First discovered at Whitianga in November 1769, during Cook's *Endeavour* voyage. this was described by Solander as *Epidendrum pendulum*,

'parasitic (actually epiphytic) on trees', and illustrated by Parkinson.

**Distribution** — endemic — North; South; Stewart and Chatham Is.

**Type locality** — Wangaroa — R.Cunningham 1834. (K-L).

**Flowers** — December-March — insect pollinated.

#### Acknowledgements

I am indebted to Peter de Lange for a preview of his range extensions in *Danhatchia* EDH

## Was it really *Corybas iridescens*?

by George Fuller, New Plymouth

I have a feeling that one of the strongest strands of the bond that holds our family together has been frequent chanting by spouse and offspring of the parable "Never under any circumstances be hoodwinked into accompanying husband/father on any enterprise involving plants and most especially where orchids are involved".

It was on this basis that my wife and I set a date in October (the middle weekend of the school holidays) to travel the 400km from New Plymouth to Napier to visit a teacher-daughter. I swear I was unaware that this happened to be the weekend of the Hawke's Bay Orchid Society's annual spring show. That is was to be an occasion

for Bruce Irwin to be presented with the John Easton Award acknowledging outstanding service to the cause of orchids in New Zealand was not a factor in the equation either. Honestly.

I must confess however that having been subsequently acquainted with these facts and not having revealed them to my wife until we reached Palmerston North was perhaps just a little deceitful of me. On reflection my observation that the rather small box of orchids that at the last minute I squeezed in beside the chest of drawers we had wedged into our liftback was "to show to friends" was only a weeny white lie because a surprising number of visitors to the show where they were displayed were in fact friends.

As it transpired the weekend was to offer two encounters with native orchids, both by accident, so to speak, and both memorable.

The first was at the show itself, when, just as I was endeavouring to extricate myself to get away to a family event for which I was already late, the beaming face of Bruce appeared. Amid the pleasantries he indicated that in his car he had a *Corybas* "that I may be interested in seeing". When Bruce Irwin phrases an invitation in that manner, native orchid enthusiasts tend to respond like the children when the Pied Piper gave a toot on his flute. How could I resist?

I was a little bemused when upon approaching the vast, only partly-filled carpark he indicated that he was parked "some distance away". After walking a block it slowly dawned on me. Of course, ever-considerate Bruce had parked out of sight of the massive venue where other activities were also taking place to avoid the risk of creating a bomb-scare!

*Sorry about that Bruce but I have never forgotten being in a car following yours through the remote and rugged hinterland of Wanganui to revisit your old colony of the true *Corybas orbiculatus* ("C" of the*

*day — Field Guide p44). As we climbed we became increasingly aware of unmistakable acrid fumes of overheating brakes or clutch. We stopped and sniffed around our car to no avail then looked ahead to see you disappearing into a blue haze in no way associated with ozone. I wondered if we would ever see your car again after leaving it in the care of the nice man in the lonely village of Kai Iwi; and here it was, years later, in a side street in Napier.*

Bruce has a puckish and mysterious sense of humour and one must always be on guard when asked to help identify an orchid. He rummaged and emerged with a margerine container in the bottom of which were several very healthy flowering plants of a *Corybas*. When asked what species I thought they were I sensed a trap because it seemed fairly apparent that I was getting a fantail's view of *Corybas papa*, very common in my home region. Bruce then pointed out that IF I was able to get a frontal view of the flower, and IF I had a hand lens, it would be apparent that I was viewing *Corybas* "whiskers"! (*Field guide* p55). Who needs practical jokers?

Despite this I still contend that Bruce is a most worthy recipient of the John Easton Award, bestowed annually on a person who has given outstanding service to the cultivation or study of orchids in New Zealand. Bruce's years of meticulous study and detailed recording of botanical makeup and geographical distribution of the native species has made a massive contribution to the correction of naming and recognition of new species recently acknowledged. Let it be also known that he has considerable skill in cultivating exotic species.

A person known for infinite patience, attention to detail and modesty, whose accolade has at last arrived. It, too, has whiskers.

Once again, I had nothing to do with the planning for the second native orchid treat.

Quite innocently we were to be taken to see Shine Falls. Take SH2 northward from Napier toward Gisborne and at about 40km Lake Tutira appears on the right side. By turning left at the solitary dairy one will ultimately reach the Boundary Stream Scenic Reserve nestling in a stream bed dominated by towering sandstone cliffs.

To view the magnificent bridal veil falls which cascade in a mesmerising fan pattern for 58m, there is a relatively easy bush walk of just under an hour, depending on the intensity of botanising.

By any standards the surroundings are outstanding, the more so because this is a deep, moist valley in what is otherwise a dry part of the country, certainly compared with my home tract on the opposite coast westward. The difference in flora is fascinating and I saw many species growing *in situ* for the first time. Native pigeons feed in our garden regularly but to see them in numbers munching up flowers of kowhai in a natural stand was a special treat, and I do believe that they may even have been lazy enough to nest in the dominating cliffs because I am familiar enough with their habits to know that several were playing hanky panky up there. They spend so little effort in building their crude nest that I can imagine a dry rocky ledge as being a gift from heaven.

Another first was seeing low trees of several species garlanded with swathes of the

lime-green clematis *C. afoliata* (without leaves). Or was it *C. quadribacteolata* (square something-or-other)? Both have limited distribution common to the east coast but I'll plump for the first because leaves were certainly in short supply and besides, the name is easier to remember. Oh yes, and another first was what I presume was *Pittosporum tenuifolium* in the wild. It was garlanded with several kilos of currants cunningly arranged to masquerade as flowers. Rather chilling was the discovery of literally



*Corybas iridescens*

glades of the tree nettle *Urtica ferox* (ongaonga) which makes the European nettle look like a floral tribute. I concluded that under no circumstances did I wish to be lost in the valley during darkness! This



native is recorded as having caused the death of at least one person.

As we progressed up the valley I was searching intently for orchids to no avail. We were within clear sound of the falls when my daughter served me the indignity of pointing out a single plant of *Earina mucronata* above my head in a dead treefern.

A few metres on we emerged into a clearing with those magnificent falls framed by the streamside bush merging on either side into the towering vertical cliffs. What drama. When Ian MacDowell and I designed and helped to build the waterfall at Pukekura Park we incorporated certain special features. One was to break up the first leap so that some water was trapped and taken laterally across the face to emerge in ever-widening patterns, then to repeat this at each lower leap. Another was to ensure that whenever possible water was channelled to burst into mushrooms of spray as it landed on the rocks beneath. Neither of us had seen Shine Falls but if ever there was a blueprint for our aspirations, this must surely be it. It was a tremendous personal thrill to see the effects in nature and I stood in appropriate awe. The spread must be almost equivalent to the height and the downdraft of fine spray comes away as a saturating blast forcing its way some distance down the valley.

The tumble of boulders and surrounding banks in this area is richly endowed with ferns and mosses. In north Taranaki these would have been festooned with *Corybas* and I just couldn't understand the paucity here. I had almost given up hope when on a single boulder, seemingly identical to dozens of others, I detected the unmistakable shape of *Corybas* leaves from some metres away. Once again, this was a reminder of how very specific the location of an orchid can be. I was in a valley which seemed to offer vast areas suitable for orchid habitation and my searches had revealed one single plant of an epiphyte and less than a square metre of a terrestrial.

The identity of the *Corybas* was also a surprise. I found only two flowers and the broad, deep maroon lip carried above the foliage and capped with a lightly speckled dorsal seemed to indicate *C. iridescens*. I note in the *Field guide* (p41) that it is recorded in this general area so the identification is probably correct.

For a strictly "no orchids" weekend this turned out to be very fruitful and the walk to the falls was the cherry on the cake. I do believe the family gained amusement if not pleasure at my botanical raving. If in Hawke's Bay don't hesitate to visit Shine Falls. Forget about the orchids, the waterfall is magnificent, but I can't help wondering how widespread the *Corybas* is, and if indeed I got the identification right.

## ***Gastrodia* aff. *sesamoides* (Orchidaceae) – a common traffic island plant in Hamilton city**

by P. J. de Lange, Auckland

Hamilton City has grown considerably since I left in 1990 for a new life in Wellington. Prior to 1990 I spent a good ten years patiently exploring the indigenous remnants of the adjacent Hamilton Basin and within

the city itself, occasionally coming up with the odd botanical surprise. However, orchids remained, by and large, infrequent discoveries, beyond that is, the ubiquitous *Microtis unifolia*, so common in lawns,



*Gastrodia aff. sesamoides* at Iwitahi, January 1997

verges and gravel paths of the inner city and adjacent suburbs, or the odd tufts of *Earina mucronata* gracing the old City Council buildings. In fact, so unusual were orchids' occurrences that I can still remember the pleasure of finding a single *Thelymitra longifolia* s.l. pushing its way up through the asphalt of the car park bordering the Chartwell Shopping Mall.

So it was that during the last weekend of November 1997 while visiting Hamilton to attend a wedding, my partner and I having arrived somewhat early, we decided to go for a little drive around town. Whilst circling a new (post 1990) inner city traffic island bedecked by that awful Canary Island ivy (*Hedera helix* subsp. *canariensis*) cultivar now so popular with the unimaginative,

we were surprised to see protruding from amongst the ivy leaves some thirty odd flowering spikes of *Gastrodia*. Stopping the car, we walked around all the traffic islands in the vicinity and found many more flowering specimens. A quick scout of the adjoining inner city gardens soon found more flowering plants growing beneath pin oak (*Quercus palustris*), tea roses (*Rosa chinensis* cv.) and assorted exotic plantings. Later that evening discussions with my botanical associate (the groom!) resulted in his discovery of further *Gastrodia* occurrences in traffic islands around the Chartwell area and near Ruakura (P. D. Champion pers. comm.).

Close inspection of all these plants soon revealed that, as in Auckland City [1], the plant involved was the same as an as yet unnamed taxon (B.P.J. Molloy pers. comm.) allied to the Australian *G. sesamoides*. Furthermore, closer inspection revealed that the *Gastrodia* was growing amongst the same pine mulch found in the Auckland and Rotorua urban occurrences by E.K. Cameron [2]. Further discussions with B.P.J. Molloy confirm that all but the unnamed taxa within the *Gastrodia* "long column" aggregate are common associates within the pine forests throughout the country. So it is not unlikely that seed of these orchids could become incorporated into the pine bark mulch when it is being produced. Thus, while the bark mulch persists, the orchid/fungal mycorrhizal association will continue to produce *Gastrodia* plants irrespective of the nature of the covering vegetation.

This is good news for orchid lovers, particularly those who live within urban settings, provided those staff involved in the maintenance of traffic islands can be convinced that the orchid is not a weed requiring regular spraying (P. D. Champion pers.

comm.). Furthermore, it is good news for this unusual orchid, which prior to 1990 was only known from a handful of specimens in a few scattered locations in the western Waikato (AK!, WAIK!, P. J. de Lange unpubl. data). Even now, in these more natural settings of the Waikato *G. aff. sesamoides* remains an uncommon orchid.

### Postscript

During the Christmas 1997 break I again ventured into the Hamilton Basin. A quick perusal of Hamilton's traffic islands soon located *G. aff. sesamoides* in the majority of the intersections across the city. Nearly, but not always, associated with the same ivy plantings and pine mulch as seen in Hamilton. Further afield, specimens were located in traffic islands at Cambridge (AK!), Te Awamutu and Morrinsville. In all cases the same taxon and association with pine mulch. Most of the specimens observed had finished flowering, and of those examined the majority had failed to set seed, however there were some notable exceptions, for example Cambridge, where over 80% of the flowers examined had set seed.

### Acknowledgments

My thanks to Catherine Beard, Ewen Cameron, Paul Champion, and Brian Molloy for helpful discussion. The patience and tolerance of Gillian Crowcroft and Robin Champion (the latter on her wedding day) thus enabling their respective husbands to banter botany over the reception table is even more appreciated!

### References

1. de Lange, P.J. 1996: *Gastrodia aff. sesamoides* in Auckland City. *New Zealand Native Orchid Group Journal* 58: 23-24.
2. Cameron, E.K. 1996: *Gastrodia aff. sesamoides* in Auckland City (2). *New Zealand Native Orchid Group Journal* 60: 4-9.

## In search of *Corybas* "round leaf"

by Eric Scanlen, Papakura

The column followed a hunch about the habitat of *Corybas* "round leaf" after he and Bruce Irwin found it under canopy at the base of the Waitonga Falls, Blyth Track, Ruapehu. They were in fading flower on 11 December 96, with wet feet by permanent cataracts. The canopy and the flowing water, according to the hypothesis, would be enough to protect the orchid from the severe frosts experienced in the sub-alpine zone.

So, with the able assistance of Graham and David Dickson on 23 April 97, a search was mounted near the Forest and Bird Lodge at Whakapapa where *C.* "round leaf" had been found in flower on 26 November 95 and 10 November 96. (NOGJ 63: 12) Most of its sizeable side-streams arrive at the Whakapapanui Stream as cataracts and four of these occurred in this vicinity. The hypothesis was one thing, getting to the cataracts was another, with scrub species clustering over the streams, often lying downwards like Beefeaters' lances. After a strenuous struggle three out of the four side-streams were found to have healthy colonies of round leafed *Corybas*, far more than the few which had been found in November but it seems that those had been only stragglers, out of their favoured habitat. The fourth stream had *Corybas trilobus* instead. All signs of flower or seed capsules had disappeared by late April and many of the leaves had yellowed making them easier to spot. The biggest cataract had most leaves and the smallest had the healthiest leaves with one measuring 50mm on the mid-rib.

To ensure the authenticity of those April round leaves, four NZNOG devotees arrived

on 6 November for a spot check. Big cataract had only seven half drowned flowers but they were indubitably *Corybas* "round leaf". Small cataract was renamed Drip because that was all it could muster at this time of year. But, the loamy ledge where the healthiest plants had been, now had some twenty well formed flowers. The column quickly(?) deployed camera gear and suffered worse than usual photographic contortions wedged among the gnarled shrubbery on the edge of a 3m drop. At least it wasn't swampy. His yelling brought Bruce, Trevor Anne and Ross who dutifully hauled themselves up the face, had a peep at this rare midget through the tripod legs then lowered themselves down again to wait patiently(?) for the clicking, flashing and muttering to finish at the orchid patch.

With the orchid being virtually plentiful here, one has to wonder why it has taken so long to be noticed? The awful access to the habitat could be one reason. No one ever needs to struggle in to these small cataracts unless of course they are seeking *Corybas* "round leaf".

So if you happen to be just below the tree line in November, near a permanent small cataract under canopy, do lever your way in to the stream and see if you can find this shy orchid. It could well be widespread and your fellow NOG members, particularly Brian Molloy, would be pleased to hear about its whereabouts, habitat and plant associations. With flowers above the leaf, its long dorsal sepal and round leaf distinguish it from the related *C. trilobus* with its similar labellum.

## The rare and intriguing from three field trips

by Eric Scanlen, Papakura

### 1. Ohakune

Bruce Irwin had a sacred and honorary commission to collect his undescribed *Corybas* specimens for Brian Molloy's eagle eye and possible species definition. A sortie to the Rangataua swamp in the shadow of Mt Ruapehu on 16 October 1997 in Nigel Hollands' (DoC minder's) 4WD, delivered us right in it, again. Frosts had dried the tops of the swamp grass in open places so searchers stuck to mossy places under tea-tree canopy.

*Corybas* "sphagnum" was not hard to find and was in full flower. (*NOG Journal* 63: 10). *C.* "rest area" was only in early bud so its site was recorded for a future visit.

*C.* "whiskers" was next in the spot light on two separate stream banks at Horopito. Nigel's waders were great but the column's brand-new long gum-boots over-topped at the first stream. Both spots had copious quantities of *C.* "whiskers", in bud and immature flower. Nigel retired from the scene leaving Bruce and a soggy-socked column to collect *C.* "Mangahuia", a dead-ringer for *C.* "sphagnum" but growing on the mossy, stony bank of the Mangahuia Stream instead of in a swamp. Again it was 3 or 4 weeks early but a few plants were in flower and were photographed and collected, all as permitted by DoC. A bonus trip that evening, to the Whakapapa Intake (diversion to the Waikato) delivered locally

abundant *Corybas papa*, *iridescens* and "Waiouru" all thriving on wet banks in the re-vegetating excavation works.

A return trip to Rangataua on 4 November saw two stems of *Thelymitra* "Comet" (from the Kawekas) being photographed (Fig. 1) at Waitahanui beach. They were in Bruce's flower pot though, thanks to an enterprising orchidologist who sent this one some years ago.



Fig.1: *Thelymitra* "comet"

The Oturere rest area had zero plants in the original colony. Ruapehu ash showers had blanketed the tea-tree covered site and it seems this colony has succumbed despite our drainage work last season. Several round leaves 15m away did give promise of a new colony. The almost inaccessible stream bank colony survives but here the small leaves and the high water mark spoke

of recent flood depredation.

At Ohakune, Ross Bishop and Anne Fraser arrived at the lodge with news of a Retaruke colony of *Corybas macranthus*(?) with the labellum longer than the dorsal sepal and the flower above the leaf. This sounds very much like the one our party found (Fig. 2) on Ruapehu's Blyth Track on 3 January 97. A must for next year!

At the Rangataua swamp next day, in Trevor Nicholls' fine car, the *C.* "rest area" colony spotted last month had vanished without trace! Most confusing. There were

no pot-holes so hares, rats, snails or slugs all came under suspicion. But Ross Bishop and the column splashed across an open bit of the swamp into a further patch of tea-tree and started finding plants in numbers. Bruce found some with dorsal sepals erect like banners (Fig. 3), a sure sign of healthy *C.* "rest area".

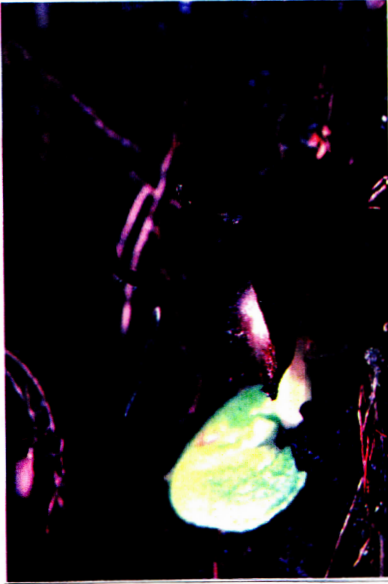


Fig. 2: *Corybas macranthus* (?) flower

That afternoon, in the column's fine S/W (Trevor and the column are not so complimentary about each others elderly conveyances) the team found the Horopito *C.* "whiskers" in abundant flower. A near orchidless climb, half way to the Mangatururu Hut from Horopito, set a gloomy note before Ross left for Owhango but a stop by the Makatote Viaduct turned up a mysterious, round leafed orchid which set four

flagging spirits back to bamboozled. *Corybas* "Makatote" (Fig. 4) is clearly in the *C. rivularis* complex but doesn't align with any tag-named to date. Bruce, who had had a hard day didn't appreciate this unwarranted complication and muttered something about rounding them up, I think. What could he mean? Collected specimens were photographed, lovingly packed by Bruce and couriered to Brian that evening for his expert scrutiny. Dinner at the Capri Lodge went down well with the team after a heavy day.



Fig.3: *Corybas* "rest area"

## 2. North Egmont, *Pterostylis venosa* and high altitude white *Corybas trilobus*

"They're open!" said Ernie Corbett on the phone and he wasn't talking about the local Bell Block watering hole. This was *P.*



Fig.4: *Corybas* "Matakoke"

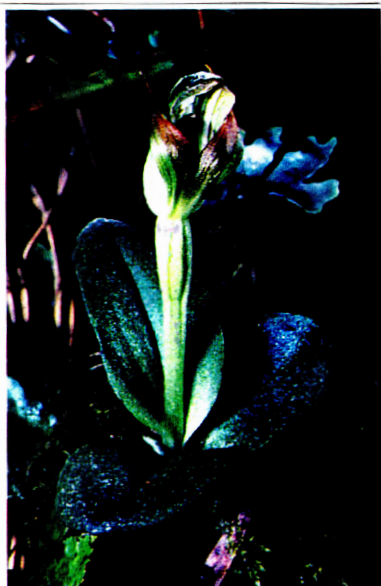


Fig.5: *Pterostylis venosa*

*venosa* at North Egmont, unseen by your column despite expeditions on two previous years at too late a date. The Carona was pressed into service on 19 November for a third attempt, thanks to the hospitality of Ernie and Joan. Soon Ernie and his fine Honda had the column aiming his lens at some selected blooms (Fig. 5) amongst the marvellous moss-covered everything on the Ngatoro walk, right on the 3,000 ft. contour (914m). The three broad-oval leaves were distinct from the broad-elliptic trio on *P. humilis* or the similar pair on *Chiloglottis cornuta*. The labella on *P. venosa* and *P. humilis* are also distinct, just as shown in the *Field Guide*. Several *Corybas acuminatus* looked out of place at this high altitude (Fig. 6) but were healthy if diminutive.

Palest green *C. trilobus*, also in flower

here, came in for close scrutiny. These looked exactly like some seen at 1,300m at Whakapapa on 10 November 96 (*NOG Journal* 63: 12; on p. 18 Cathy Jones reported another from 1,240m in Kahurangi National Park on 11 December 96). John Dodunski has proof that these high altitude whites flower as normal maroons when flowered near sea level. Ernie lifted a white dorsal sepal with a twig and revealed the normal maroon colour on the covered part of the labellum. External whitening at high altitude may be caused by low temperatures preventing the suffusion of colour as the flower opens? Is there anybody out there who can comment on this phenomenon? It is probably unrelated to albino(?) specimens of Max Gibbs' and the Editor's (see *NOGJ* 52: 40).

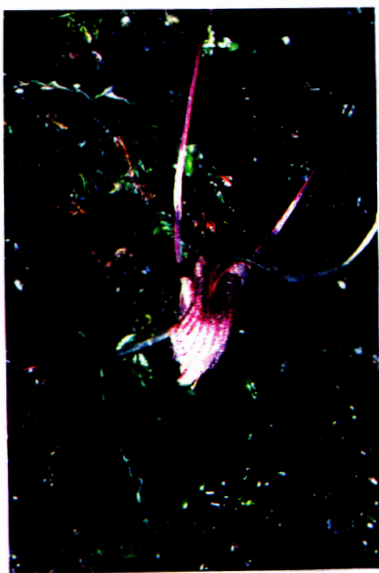


Fig. 6: *Corybas acuminatus*

*Pterostylis venosa* were sparse at the Ngatoro walk so the much longer Veronica walk was traversed on half remembered advice from Bruce. Early *Chiloglottis cornuta* and *P. patens*, some few in flower, were common in the lower parts but only 12 scattered *P. venosa* were found at about the 1,100m mark. Only early shoots of the later flowering *P. humilis* were seen on the dash down the N. Egmont track. The dash was for Joan's well appreciated dinner and the column's 3-D slide show for local orchid enthusiasts, organised by Ernie at short notice.

#### 2A. Iwitahi, two clones of *Chiloglottis valida*

After being introduced by Ernie to an intriguing 100,000 year old pukatea stump teetering in the Bell Block beach cliff, the

column faced the tedious round-about drive from Bell Block to Iwitahi next morning. Noon saw him and Trevor Nicholls poring over massed flowers of *Chiloglottis valida*. The aim was to record the difference in labellum calli between clones 1 and 2. The abundant, rain-soaked flowers peered skyward from Trevor's wire-netting covers with near closed labella. A few sharp flicks with a forefinger soon removed the water from one and disclosed the labellum's sensitivity to this sort of treatment. First it swayed down and up with each flick then locked itself permanently(?) down simplifying callosity inspection. This behaviour may well be tied in with wasp pollination but just how is not at all clear. Clone 1, first found thriving in the old reserve, has been shifted in blocks of FRP, (fungus reinforced pine-needles) and now thrives in the Iwitahi Orchid Reserve. It has 4 black calli symmetrically disposed as sexual attractants for the (absent in NZ) Thynninae subfamily of wasps (see *NOGJ* 56: 28). Clone 2, also being shifted to the Reserve, has a cluster of little black calli in lieu of the two lateral calli of clone 1. Perhaps the male Tasmanian wasps find this arrangement more attractive? You may well ask, why the description, where are the 'photos? Don't ask!

*Pterostylis* aff. *montana* cried for attention to further the ongoing Irwin/Dodunski/Scanlen attempt to unravel this puzzling complex but intensifying rain put paid to that and triggered the last phase of a 1,000Km, two day expedition.

#### 3. The Puffer Track, *Caladenia nothofagei*, C. "big pink", maroon *C. chlorostyla* and *Corybas* "quadriplex"

The Editor, who had long talked of organising field days on the Puffer Track and Mt. Holdsworth, was as good as his word but only after the column offered to lug his



projection gear to Kaitoke north of the Hutt. Thus the Kiwi Ranch saw a gathering of native orchid devotees from the triangle of Waitakere, New Plymouth and Wellington, on 5 December 1997. They dined in state (for a field trip) saw and enthused about the 3-D show of NZ orchids then debated their finer points well into the night before retiring to their bunks.

The Saturday morning sun illuminated some 15 souls sauntering up the nearby Puffer Track eager to see *Thelymitra x dentata* but the cool southerly ruined any chance of that. Instead, *Thelymitra matthewsii* was wrongly reported right, left and centre because of the curiously cork-screwed leaves emerging — after the track had been sprayed late for the gorse!!! However, the first bit of bush without gorse had escaped and some delicate pink *Caladenia* with triangular yellow mid-lobes appeared on the bank (Fig. 7). The 'photo record shows them to be, not *C. minor* as was first thought, but a small form of *C.* "big pink" common at Iwitahi. Not the regular form with two single rows of calli but the uncommon one with two double rows of calli and little clusters at either side. This is the only one the column has recorded from Iwitahi (2 December 94), close enough to examine calli detail yet examination by Bruce Irwin and the column of a dozen blooms during transplanting at Iwitahi on 13 December 97 detected only regular flowers. Just another puzzle for next year.

*Corybas oblongus* abounded along the Puffer and in places, half the plants had large, purple veined leaves and the twin flowers which the Editor has tagged *C.* "quadriplex" (see *NOGJ* 62: 4). The flowers (Fig. 8) have the oval labellum of Auckland area *C. oblongus*. Note that the second flower branches off below the ovary in lieu of the usual apiculate bract hence most paired flowers are jammed together quite



Fig. 7: *Caladenia* "big pink"

unphotogenically. The lone specimen from Clevedon (*NOGJ* 65: 24), looks strikingly similar. The column subsequently got all excited about these plus the two regular forms of *C. oblongus* found by himself and confirmed in *NOGJ* 61 by Bob Goodger and H. B. Matthews (typed transcripts of the latter, available on request) but it may take a while for the confusion to clear enough to write about it.

A half open *T. pulchella* first raised hopes then dashed them, that the elusive *T. x dentata* had opened. It only served to delay the photographers whilst the main body forged ahead and found *Pterostylis tasmanica*, past its best, the alpine form of *Prasopphyllum colensoi* and *Caladenia nothofageti* (Fig. 9). The sharp eyed Editor located two of these in flower, 12m apart which halved the photographer queuing pressure and let



Fig. 8: *Corybas* "quadrplex" from the Puffer

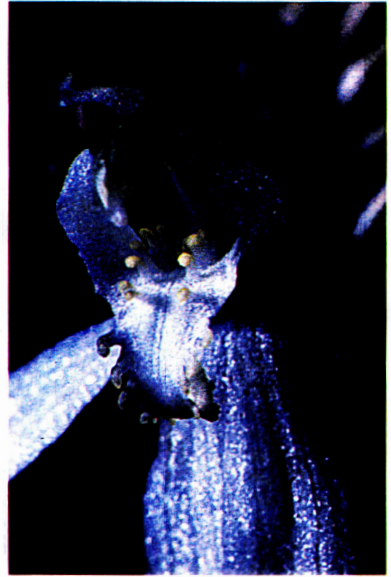


Fig.9: *Caladenia nothofagei*

them suffer the usual contortions, numbness and cramp in pairs. At least it wasn't a bog.

The Tararuas' greywacke generally lets ground-water drain down the numerous fracture planes in dry spells so is unfavourable to the *Corybas rivularis* complex. They prefer Taranaki style sandstone with their characteristic year-round seepages from exposed bedding planes. One seepage on the Puffer was the exception and sported a green head of moss smothered in a *Corybas* with glabrous, round leaves having smooth copper coloured rear edges. It sported only one seed capsule from say 50 plants and was said to be *C.* "rest area". Close scrutiny of Ruapehu's *C.* "rest area" on film does show a faint coppery edge to a much less shiny leaf. Next year, could some one else please look at those on the Puffer Track?

An unsprayed branch track, leading through the pines directly down to Kiwi Ranch, took the attention of a tardy splinter group. Several orchid species flourished amongst the tea-tree but notably, a maroon stemmed *Caladenia* with 2 to 4 like-coloured buds (floribunda?) on each hairy stem. One was open (Fig. 10) so it posed for the column's close-up attempts with the button pressing assistance of other NOG members. The photo's show a striking resemblance to *C. chlorostyla* s.s. (Fig. 11, from Albany Scenic Reserve, also found at the Puffer) although Jones et al state unequivocally, "Scape ...slender, wiry, green..." A red stemmed form (hardly maroon) does occur in the north, e.g. at Albany Scenic Reserve and the Coromandel's Pinnacles. One has to wonder if the *Caladenia* debate is really closed or just warming up?



Fig. 10: Maroon-stemmed *Caladenia chlorostyla*

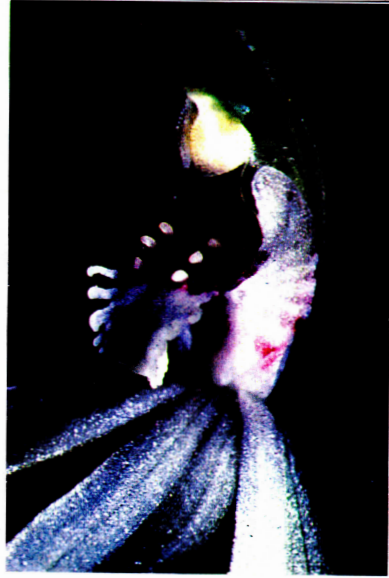


Fig 11: *Caladenia chlorostyla*  
from Albany Scenic Reserve

After dinner, the Kiwi Ranch water-tank track led some stayers through the pony paddock to a tea-tree covered hill in bright, daylight-saving sunshine. It yielded, notably, unopened *Thelymitra circumsepta*, *T. hatchii* and a little green *Caladenia chlorostyla*. Catherine Beard, notebook at the ready, knelt to examine the latter with her 10 power. "Does it have a perfume?" asked her Aunty Anne. The rejoinder, "All I can smell is horse dung!" was no surprise to the others who could see the generous dollop just out of Catherine's view.

### 3A. Mt. Holdsworth

The homeward trek on Sunday was broken at Masterton for a cool tramp headed by the Editor, up the Mt. Holdsworth track. But

the expected *Thelymitra* species were notable this year for their near absence. A few specimens of *T. intermedia* were shut like spring traps. In the impressive forest below, *Adenochilus gracilis* took centre stage and one yielded the secrets of its labellum to the cameras.

An excellent dinner including a "species list salad" as Catherine dubbed it, at the Brown Sugar Café in Taihape, was a highlight in a memorable field trip. Many thanks to Anne for putting up three of us, both on the way south and for the return journey.

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## Notes

Brian Molloy, David Jones and Mark Clements have written two further papers describing **new species and a new genus** in preparation for their catalogue of the NZ orchidaceae now in the final stages before publication.

The first paper names six new species of *Pterostylis* [1], and the second gives a new name for the plant we have known as *Lyperanthus antarcticus* [2].

Thus *P. rubricaulis* becomes *P. agathicola* ("kauri dweller"); previous names were invalid or inappropriate.

*P. cernua* ("nodding") is a new species, and a new plant to most of us; it is a small *Pterostylis* with affinities to *P. montana*, and has so far been found in only one location near Okuku Reserve near Arthur's Pass in the South Island.

*P. "Erua"* becomes *P. irwinii* (see cover and editorial in this issue).

*P. linearis* becomes *P. paludosa* ("swampy"); previous names have been confusing so the authors have chosen to describe the taxon afresh.

*P. aff. graminea* becomes *P. porrecta* ("stretched outwards and forwards"); the illustration of the species in the paper is incorrect - it is actually a duplicate of that of *P. tanyponda*.

*P. aff. cycnocephala* becomes *P. tanyponda* ("stretched out stalk").

*Lyperanthus antarcticus* becomes *Waireia stenopetala*. The plant has for years concerned taxonomists who have regarded it as ill-placed in *Lyperanthus*. It has now been recognised as a monotypic NZ genus, named *Waireia* ("water-peat"). It has been given the specific epithet *stenopetala* ("narrow petals") after the herbarium specimens on which Hooker's *Thelymitra stenopetala* was based were found to be this taxon.

## References

1. Jones DL, Molloy BPJ, Clements MA. Six new species of *Pterostylis* R.Br. (Orchidaceae) from New Zealand. *The Orchadian* 1997; 12 (6): 266-281.
2. Jones DL, Clements MA, Molloy BPJ. *Waireia*, a new genus of Orchidaceae from New Zealand. *The Orchadian* 1997; 12 (6): 282-287.

Maureen Young wrote (9 November), "It would be of interest to me, and maybe to other members who don't have access to the *Orchadian* or the *Journal of Botany* if, when you notify us of name changes, you could also publish the **authority for the name change**. These are very difficult to track down otherwise. I also suggest that when a list of species is published, as in the December issue, that if all names that have been changed since *Flora II* had the authority printed beside them it would help to distinguish official name changes from unofficial ones."

*I wasn't sure what "authority" meant, so I asked Dan Hatch. He responded, "'Citation' and 'authority' are not necessarily the same thing. For example the citation for *Aporostylis bifolia* is (Hook.f.) Rupp & Hatch. The authority is Rupp & Hatch in Proc.Linn.Soc.N.S.W. 70: p60 (1946)." The Catalogue in preparation by Brian Molloy and his Australian colleagues will answer all these questions - Ed.*

A contributor to the *Orchid List Digest* wrote she had heard that "*Max. tenuifolia* smells like 'the coconut cream pie you KNOW has just come out of the oven.' I was somewhat disappointed at the musty odor of mine when it bloomed, and then I read that it smells like MUSTY coconut. Which is it, or does the species follow the entire spectrum of coconut smells?"

"I suspect each of us perceives aromas differently. I know that at orchid meetings, we frequently compare our impressions of orchid aromas and many times do not agree. Actually it would be interesting to do this as a group activity, with each person filling out a secret ballot and then comparing results.

"Years ago, as a chemistry student we worked with arsenic salts (I think I have it right) and I thought they had a very strong almond smell. No one else in the class could smell it. Several weeks later I found a reference that confirmed what my nose told me. I feel the same about celery — I think it stinks to high heaven.

"When it comes to orchids, I usually do not notice the aroma unless it is strong."

*Interesting: Eric Scanlen tells me only those who can smell Boronia (apparently an inherited capability) can also smell the fragrance of Prasophyllum aff. patens - Ed.*

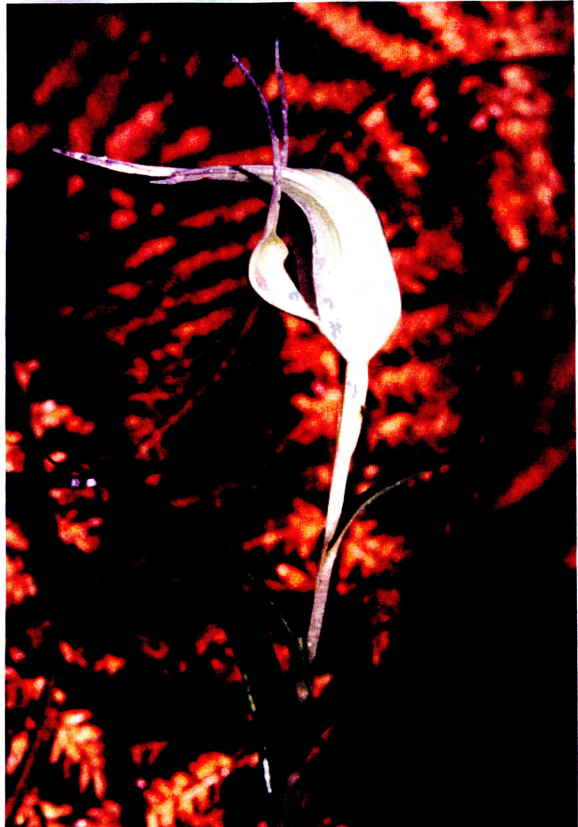
**R**on Whitten wrote "On Labour weekend 1996 I came across an almost white (flowered) form of *Pterostylis banksii* (pictured to right →) up the Te Puru stream north of Thames. The flower had some very faint pale green striping. The stem and leaves were the normal dark green colour. I went back Labour weekend this year to get more photos but the plant had finished flowering.

However, I did come across a small group of *P. cardiostigma*. Is this a first for the Coromandel?"

*Can anyone answer the question? - Ed.*

**T**he New Zealand Orchid Society is holding its 50th anniversary celebrations in 1998. Vice President Noel Townsley writes, "As part of that celebration we are holding a **special show at the Ellerslie Convention Centre, 9-13 September....** It would be great to see the NZ Native Orchid Group represented, and I would be pleased if the Group would give consideration to mounting a display at this event. This would be an excellent opportunity to educate an orchid-interested general public (and a few orchid growers to boot) on our own native plants."

*Good idea. OK: are there any volunteers to organise this? - Ed.*



**T***helymitra* "Ahipara" is the tagname given to one of the new taxa Doug McCrae discovered in the Far North a decade ago. Its identity has puzzled many of us since, and indeed I was under the impression that it was one of the "*aff. longifolia*" group. Not so, as Peter de Lange pointed out (*personal communication*). He kindly sent a copy of a paper he had co-authored in 1991 [1]. The taxon is one of two (the other is *T. "darkie"*) that are quite different from other NZ *Thelymitra*: the two have the same chromosome number and are self-pollinating, but they differ from each other in morphology, time of flowering and habitat. *T. "Ahipara"* has pale blue-lilac flowers, most similar to *T. pauciflora* (especially *T. intermedia*), which never open, and a curiously compressed bright green leaf; it can tolerate seasonal flooding, some plants even flowering from pools of water. Its original discovery site, a private swamp in Sandhills Rd, was to be developed, so nearly 400 plants were transferred in 1990 to Lake Ohia (where a small natural population was known) and to a wetland in the Ahipara Gumfields Historic Reserve.

#### Reference

1. de Lange PJ, Crowcroft GM, Forester LJ. *Thelymitra* "Ahipara" an endangered orchid transferred, with notes on its taxonomic status, distribution and ecology. Science and Research Internal Report No. 113, Department of Conservation, Wellington].

**M***icrotis aff. parviflora* was found by Margaret Menzies on the "Pahiatua Track" (the Palmerston North to Pahiatua road) in early December – a new species for that area.

**N**otes by the editor on *Gastrodia* "long column" in the southern North Is.

On 2 January I found a colony of three spikes of *Gastrodia* "long column" in a

weedy area under tutu on a terrace raised a couple of feet above the Turanganui river headwaters in the Aorangi range in southern Wairarapa. They were then in bud.

On 14 January I counted the flowers: the largest spike had 60 flowers, the next 36 and the third 32: a fourth spike had appeared and was still in bud. The open flowers were strongly scented — the fragrance of frangipani with a hint of citrus (Kristy McDonald, she-who-knows-her-perfumes, agrees: *pers.comm.*) — and the spikes were continually visited by what appeared to be gasteruroid wasps. They alighted on the spikes, but flew off quickly and did not enter the flowers.

On 24 January the fourth spike had been crushed by cattle, the first and third spikes had a mix of fruit and still-open flowers, and the second spike's flowers were all over. The fruit were upright and closely held to the stem. Counts are shown in the table.

Could this be an insect-pollinated *Gastrodia*? Certainly there were ample suggestions that insect pollination is the predominant mechanism.

- the flowers are more colourful and they open wider than those of other NZ *Gastrodia*;
- 50 of the 60 flowers on the first spike were open at the same time;
- they were heavily scented;
- the labellum is colourful, decorated with calli, and is quite mobile — in these plants it fluttered visibly in the breeze;
- the pollinia were adherent, coming away intact with the anther cap at the slightest touch. Indeed, the anther caps and pollinia were missing from many of the lower flowers of these plants;
- the anther and stigma are widely spaced;
- there is a wide shelf of columnar tissue separating the pollinia from the stigma;

- the flowers are pendant (quite vertical and held closely to the stem), so pollen falling by gravity would miss the stigma. Others have noted that as the flowers mature, they turn upward, and this has been suggested as a self-pollination mechanism, but in these plants only those flowers that had already begun to set fruit were turning upward, to form quite vertical fruit: unfertilised flowers seemed to drop off before turning upward);
- seed production is incomplete. A further visit on 24 January showed that only five of 36 flowers on the second spike had set fruit. Furthermore 21 flowers of 60 on the first spike, and 6 of 32 on the third spike had failed to set fruit and had fallen off.

finished flowering, their dark stems packed with what looked like a fruit for every flower, suggesting self-pollination. There were even larger colonies (up to 18 spikes) of the yellow-flowered and scented *G.* "long column". The latter were in late flower and fruit, though fruit set was quite patchy, and several spikes were quite bare.

Table:	<i>Spike</i> 1	2	3
buds	0	0	0
open flowers	15	0	20
closed flowers	8	5	0
fruit set	16	5	6
missing flowers	21	26	6
<b>Total</b>	<b>60</b>	<b>36</b>	<b>32</b>

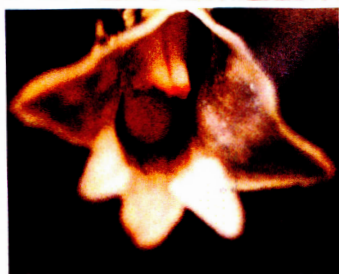
It is difficult to imagine exactly how insect pollination takes place (if indeed it does). An insect attracted by the colourful and mobile labellum might crawl inside the flower, and to do so would have to pass the anther cap and pollinia, which are easily dislodged. But they form a quite large almost spherical structure, so if the pollinia were to stick to the insect, the anther cap would have to fall away to expose the pollinia (perhaps it stays there to protect against selfing, then comes away as the insect leaves the flower). To reach the stigma in the depths of the next flower, the pollinia would either have to adhere to the front of the insect, or the insect would have to turn around inside the flower to deposit pollen adherent to its rear parts. But this is pure speculation.

### Postscript

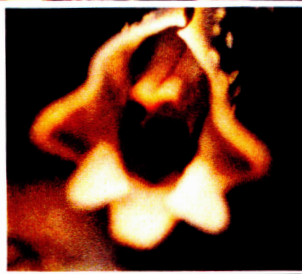
On 31 January Ken Wright of the Wellington Regional Council introduced me to Bartons Bush in the Trentham Memorial Park; he had cleared it of possums three years ago, and now *Gastrodia* were turning up everywhere you looked under the tawa. Large colonies of *G. aff. sesamoides* had



Column and labellum



Anther cap present



Anther cap absent



*Gastrodia* "long column, Aorangi Range: Spike 1 on 2 January 1998.



## Exotic tales from the internet

The collection of wild orchids in Peru has become a problem, wrote one correspondent, "This is a world-wide issue, by no means limited to orchids, and only very modestly influenced by the export market. Rather, it is door-to-door 'ambulantes' — sales people — and markets at which these flowering plants are sold to local people as decorative plants. These are mostly discarded after flowering. (Another contributor) notes the effect on Javanese populations of sales to weekend tourists at popular resorts. I recall driving down from Tarma to San Ramon in Peru and, at each roadside pull-in, being offered plants such as *Epi. radicans* and *Lycastes*, flowering out of the paraffin cans into which they had been hastily stuffed. There is, in essence, no solution to this, save the encouragement of local nursery production of decorative species. Purpose-grown plants will almost always make wild-collected ones look battered and of low quality. A small project near, let us say Cuzco, growing *Masdevalias* for sale as decorative plants, is the surest shield for the decorative wild species."

Doug Vye of the Ottawa Orchid Society wrote recently to an orchid bulletin board, "I have been visiting Costa Rica in March for the past five years and have a few favorite locations for finding and photographing orchids.

"Monteverde (Monteverde nature preserve and Santa Elena nature preserve): in the Monteverde nature preserve do the perimeter board walk and watch for miniatures. Last year by examining fallen tree trunks and stumps we found about ten different *Pleur.* and *Masd.* species in bloom, one with a plant about the size of a penny with

blossoms the size of grains of rice. It is also eerily beautiful to walk with the clouds blowing through the trees and not hearing anything but the wind and occasional bird calls (very few people walk the perimeter loop). Santa Elena nature preserve is not as popular with tour groups and as a result you are more likely to find plants along the shorter paths.

"Docimal area (Hacienda Baru): lots of *Brs.*, *Max.* and *Gong.* species in this area. Lots of *Pleur.* if you drive a ways up dirt roads and check out the trees along cattle pastures. Hacienda Baru has a large net covered area of plants that are local.

"Los Horquetas (Rara Avis): good selection of *Masd.* in higher elevations, once again check trees along cattle pastures. Rara Avis is nice, but you have to put up with a three hours tractor/wagon ride through mud to get there.

"La Fortuna (Tabacon Hot Springs): walk along the paths towards the volcano and you will find miniature species that like dry hot conditions in the sparse bushes. The trees along the road to the La Fortuna waterfall (Cascada Fortuna) are full of orchids usually in bloom in March.

"Last year some people we met at Hacienda Baru mentioned a large orchid garden in Golfino and we may try and find it this year. Be sure to be extremely cautious when examining fallen trees; last year at Rara Avis one of the trees we were going to examine had a very, very poisonous Eyelash Viper sitting beside a blooming plant. Needless to say we took the pictures using a telephoto lens. Use a long stick to probe the fallen branches before you approach any plants. Be careful and you will be able to find something incredible."

**H**ave any orchid species come into being from hybridization? was a question asked recently on the *Orchid List Digest* bulletin board. One answer -

"Species come into being because through one mechanism or another, a gene pool is isolated from its parental population and subsequently tracks a distinct pattern on the local fitness surface. Isolation may be (and often is) geographical, or it may be functional: the orchid flowers at a different time (there is an example of two closely related species which differ in the time of day when their flowers open, and which are therefore genetically segregate when sitting on the same branch) or it uses different pollinators.

"At issue is whether hybrids are prone to be segregated. Clearly, this is possible; and research in animals (where individual-on-individual selection is important) shows that hybrid swarms tend to associative mating: like cleaves to like. Whether bees — say — do the same with plants has not as far as I am aware been the subject of direct research. Certainly, however, bees and other insects learn quickly which flower has offered a reward and seek another like it. This is why orchids are so distinct: all of their genetic material is tied up in a single packet (rather than in loose pollen grains) and they get one shot. If the bee fails to visit another flower of the same species, the shot has missed. They thus 'imprint' the insect heavily, with rewards and pheromones, and offer a highly distinct shape on which to imprint. That a hybrid swarm of plants would tend to associative mating as a result of this dynamic seems evident."

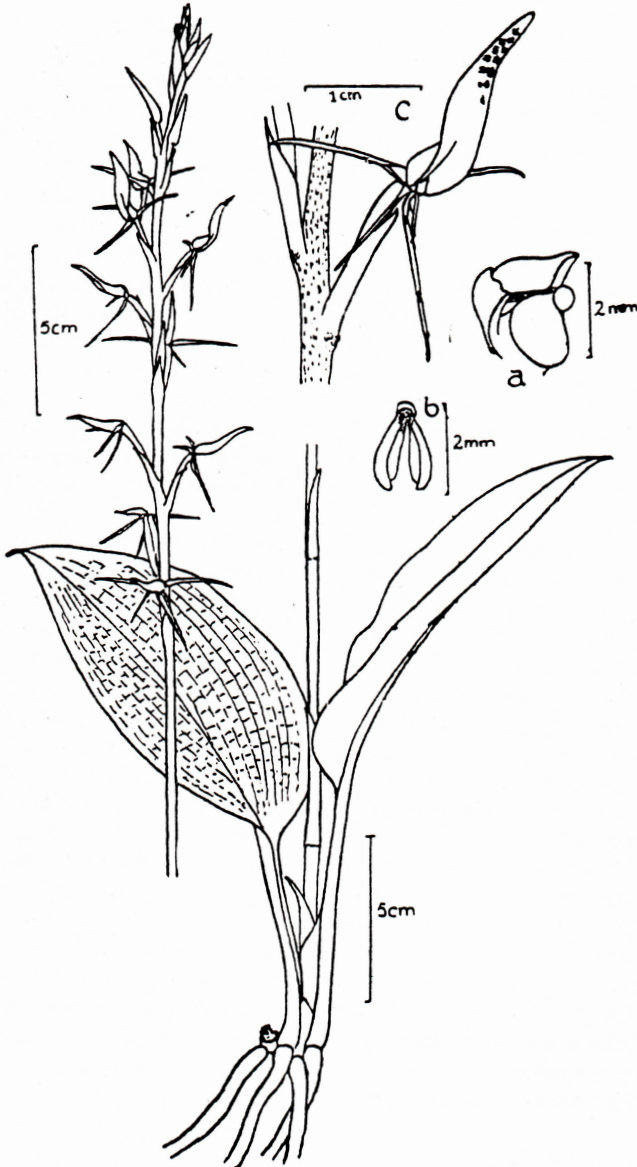
**A** contributor to *Orchid List Digest* wrote, "Here in Key West where I grow outside I have no control over how many **treefrogs** may decide to live with my plants.

The good part is listening to them drum and sing in the spring and summer. The bad part is that they will burrow into sphagnum and other media and make homes. It isn't immediately a bad thing but down the road as the plant fills the pot they may deter new growths from arising on the side of the plant that they live on. Also as they do their business there you are getting a secondary fertilizer source that is hard to gauge and I have noticed root rot in extreme cases. Other than these two points I don't see how they affect the orchids adversely. As to fertilizing and pesticides I use them weekly and still have hundreds of frogs, lizards and snakes that live with my plants and I don't find any dead carcasses, so if it is toxic to the reptiles it is not immediately evident. If a frog makes a nest in a plant and you don't want him there the best solution is to move the plant 10-15 feet away from where it was. For some reason they can't find that one again right away. All in all they are nice pests that don't do damage as bad as sucking things like thrips and scale. As to providing supplementary food for them I don't think that is necessary, but you may notice a lack of flying insects in your greenhouse."

**F**rom the *Otago Daily Times* (!): forest fires and illegal logging in **Indonesia** are threatening the survival of five of the 150 types of orchids found on the islands of Maluku. The chairman of the Indonesian Orchid Lovers, Lenny Assegaf, called on local governments and forest concession holders to support efforts to save the flowers from extinction. He listed the five endangered species: *Dendrobium anytenatum*, *Gramatophyllum scripturn*, *Vanda hooke-riana*, *Dendrobium veralivalium*, and the fifth, identified by its local name, Anggrek Tongkeng".

## Close relations: orchids like ours

*Cryptostylis arachnites*, from RE Holttum's *Flora of Malaya* Volume 1:  
Orchids of Malaya. Government Printing Office, Singapore, 1957. p104.



## Australian notes

The ANOS Victorian Group *Bulletin* of October 1997 carried "News from the Royal Botanic Gardens, Cranbourne - remaining fragments of wetlands should not be put at risk", which included the following paragraph —

### The Naked Sun Orchid (*Thelymitra circumsepta*)

The delicate Naked Sun Orchid grows in the reasonably shallow and flat bottomed wetlands of the Royal Botanic Gardens, Cranbourne. In order to survive, it depends on a healthy environment which floods regularly. Its leaves and flower spikes pop out of the water in October. Its flowers only open on hot, steamy, sunny days in December.

First described in 1944, it is a rarity among sun orchids because it does not have a hood above the anther — hence its common name the Naked Sun Orchid. The flower is seldom found in lowland swamps, preferring alpine peaty areas or sphagnum moss bogs.

Helene Wild wrote (ANOS Victorian Group *Bulletin* June 1997, p3), "John Landy's name was on everyone's lips during the 1950s. He was one of the bright lights of Australia's athletic elite. John was the runner who set Australian and World Records for the 1500 meters and the mile, and who won Olympic and Empire Games medals. In the 1956 Olympic Games in Melbourne he read the oath on behalf of the participating athletes.

"John has also achieved considerable success in his working life where he has been concerned with agriculture. For eleven years, he was Research Development Manager of ICI Australia's Rural Division; he was a foundation member of the Land Con-

servation Council; was elected a Fellow of the Australian Institute of Agricultural Science in 1984.

"In 1984 John wrote *Close to Nature*, a diary recording his observations and photographs on his family's property near Goryong at the foot of the Snowy Mountains. This beautiful book won the 1985 C.J. Dennis Literary Award for Australian natural history and was followed, in 1993, by another superb publication *A Coastal Diary* — a study of the Otways, one of Australia's wildest and most beautiful coastlines. John considers himself an amateur photographer, but the photographs in his books are a far cry from touristy snapshots! He also claims that he is not an expert on native orchids... but impressed us with his understanding of the life cycle of Victorian terrestrial orchids and their pollinators."

**H**ow many orchid species are there in South Australia? asks the editor of *NOSSA Journal*, Bob Bates. His answer: 1000+, if you include wild and cultivated species, with another 1000 different wild and cultivated hybrids likely.

**W**alter Thomas (Wal) Upton has been awarded the 1997 Australian Orchid Foundation Award of Honour, an award that recognises achievements in orchids in Australia.

**G**astrodia *sesamoides* is known in South Australia as the potato orchid (for its large starchy tubers), or as "cinnamon bells" — "the name comes from the spicy scent of the flowers, which although not the smell of cinnamon, is probably the closest smelling spice" (T. Bridle in *NOSSA Journal* 1997; 21 (11): 104).