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## Obituary: Edwin Daniel Hatch FLS 1919-2008

Dan Hatch died in his 90th year, on 4 November after a short illness. He had been intellectually able and contributing to debate about native orchids until shortly before his death.

Dan Hatch is one of the great contributors to our knowledge of New Zealand orchids. His father's family moved to the native bush at Laingholm, on the Manukau coast at the foot of the Waitakeres, soon after their arrival in New Zealand in 1922 and Dan Hatch lived there all his life. He grew up with botany, and botanised from age fourteen.

During the 1939-45 War Dan Hatch was posted to Waiouru. Nearby he found seven orchids not listed in Cheeseman's *Manual of the NZ Flora*. He sent them to the Botany Division of the Department of Scientific and Industrial Research, but at this time Botany Division was not working on orchids.

They suggested he send them to the Rev. H.M.R. Rüpp in Sydney. Meantime he had acquired Nicholls's *Gems of the Bush* published by the *Sun* newspaper in Melbourne. So he wrote to Rüpp, care of Nicholls, care of the Sun. To his delight, both men replied. Rüpp had been working with H.B. Matthews until the latter had lost his sight, then with Lucy Cranwell (who had the Matthews collection in the herbarium at Auckland Institute and Museum).

Rüpp had a revision of New Zealand orchids half completed. The two men were poles apart – Hatch was twentysix, Rüpp over seventy. They collaborated with the first paper, "Relation of the orchid flora of Australia with that of New Zealand", and after that Hatch set out to describe all the New Zealand orchids.

He wrote nineteen orchid papers for the *Transactions of the Royal Society of New Zealand* from 1945 to 1963 – among over a hundred published botanical papers.

His father, the senior E.D. Hatch (a domestic architect of the Arts & Crafts movement), drew most of the orchids for the *T.R.S.N.Z.* papers, but Dan Hatch did his own illustrations for his booklet *Auckland's orchids*, and for his papers on the leafless spider orchid *Corybas (Molloybas) cryptanthus*, and on the equally strange leafless *Yoania (Danhatchia) australis*.

He was honoured by the generic name *Danhatchia* Garay & Christensen, and in the specific epithet of *Thelymitra hatchii* Moore. He was made a Fellow of the Linnaean Society.

Dan Hatch was the quintessential amateur botanist: an expert in a narrow field at a time when professionals were simply not interested, or had more pressing work. In New Zealand orchidology he bridged the gap between Cheeseman and Moore. He made mistakes – but so did Cheeseman and Moore; so, indeed does every scientist who publishes: that is in the nature of science. He was criticised for those mistakes, and was stung by the criticism, retreating to relative isolation in the Laingholm bush.

Nonetheless he continued to contribute his vast store of knowledge to friends and orchid colleagues. He took me under his wing when I first became interested, and continued to provide help and advice until very recently. Eric Scanlen emailed, "Dan was my orchid mentor in early years," and Colin Ogle wrote, "Dan's *Auckland's Orchids* (1959 edition) was an inspiration to me when there was little else available with illustrations. I called on him at Laingholm in about 1965 with my 35mm slide collection of orchids and spent several hours with him. He was so interested and encouraging in my tentative steps among our orchids. In all his writings for Auck Bot Soc, NZNOG *Journal* etc, I enjoyed the way he'd 'stick his neck out' and put his current thinking about orchids in writing, leaving space for other people to agree or otherwise. NZNOG *Journal* has extended with this approach for all observers, but I saw Dan as a pioneer, not just in orchid research, but in stimulating 'amateurs' to observe and record what they found. May we all continue to work from his example."

May we indeed.

Ian St George

# Original papers

## Population ecology of *Thelymitra matthewsii*

By E Anne Fraser (the abstract of her MSc thesis)

The terrestrial orchid *Thelymitra matthewsii* Cheeseman, uncommon in New Zealand, was studied to increase knowledge of the species' life cycle, morphology and ecology. Results will enhance future conservation management for the species.

New information related to the morphology of *T. matthewsii* was obtained. The species was found to emerge in one of four discrete life stages of distinctive morphology and height range that remained constant for the season, not developing into a more advanced life stage. The leaf of the three pre-adult life stages designated a hook, a spiral, and a non-flowering stage, did not inflate at the base, but rose smoothly from the tuber. Apparent morphological differences in the column between descriptions of the Australian taxon and the small New Zealand sample examined suggested further study was needed.

Comprehensive monthly monitoring was carried out at five study sites in three locations in the Te Pahi area of the Far North, from 2002 to 2004. No patterns emerged in plant life stage succession, flowering, and presence or absence at labels reinforcing the concept that variability was a common component of the population census.

Seasonal and partial absence was a major component of the populations. An average of 32.8% of plants, over five study sites, were present throughout three seasons, while 66.9% were recorded as absent (not visible) at monitoring. New plants appearing in 2003 and 2004 showed a high percentage of subsequent absence (mean 85.7%).

To determine population stability, recruitment and absence were compared. Plant ab-

sence exceeded recruitment by 7% (mean plant absence 30.5%; mean recruitment 23.4%). Plants continued to appear during the monitoring period, and labeled plants increased two-fold over commencement numbers. Adults recorded as 28% of labelled plants over three seasons, were outnumbered by preflowering stages. Only 5% of population numbers exhibited succession from a smaller to a flowering plant. Life stage modelling indicated a life stage was more likely to be followed by the same stage than an expected successive stage.

*Thelymitra matthewsii* was found to be present in four substrates in the Far North. The survey of vegetation found the indigenous species *Kunzea ericoides* and the exotic *Hakea gibbosa* dominant for both height, and cover. Litter and bare ground dominated ground cover. Differences in vegetation and ground cover, of sites supporting *T. matthewsii* and comparison sites that did not, were minor and suggested that another factor, for example a suitable fungal partner, influenced the species' presence or absence.

The results of the study indicated the present threat classification of *Thelymitra matthewsii* is inadequate in the light of the species relatively circumscribed, widely separated habitats, the small number of reproducing individuals and vulnerability to habitat modification.

### Reference

Fraser, E.A. 2008. Population ecology of *Thelymitra matthewsii*, Cheeseman, Orchidaceae, in northern New Zealand. Master of Science Thesis, University of Waikato.



# The Type locality: Ian St George

## 4. The Tararuas and *Pterostylis graminea*

### The description

JD Hooker described *Pterostylis graminea* in his *Flora Novae Zelandiae*.

He wrote,

“Hab. Northern and Middle Islands. Auckland, Sinclair, East Coast, Colenso. Otago, Lyall. A small species, 4-6 inches high, like a miniature of *P. banksii*, but without the long tails to the perianth, which is only  $\frac{1}{2}$ - $\frac{3}{4}$  inch long.”

He wrote later in the *Handbook*, “Slender, leafy, 6-10 in. high. Leaves sheathing, narrow linear-lanceolate, 1-3 in. long. Flowers solitary,  $\frac{3}{4}$ -1 in. long, of the same form as *P. banksii*, but much smaller, and the sepals less produced into slender tails.... Probably only a small state of *P. banksii*....”

Nowadays we recognise several taxa in the *Pterostylis graminea* aggregate. Which of them is the true *P. graminea*?

### The type specimen

The type sheet at Kew contains Colenso specimens numbered 1742 and 1960. They were sent to Kew in July 1848 in a letter containing plants numbered 507 to 2318.

No.1742 is the lectotype for *P. graminea*. The relevant entries in Colenso’s plant list read as follows...

1738. *Thelymitra montana*, W.C., fine sp., clayey hills, Tararua.

1739. *Microtis*, from ditto.

1740. *Dendrobium*, ditto; Epiphytical, on large trees. A sp. apparently near *D. biflorum*, certainly distinct from *D. Cunninghamianum*; – *D. Tararuense*, W.C.

1741. *Grammatid exudatum*. (vide no. sent before), Tararua.

1742. *Pterostylis graminifolia*, W.C., — growing with 1738, & 1739.

### The type locality

Colenso’s first visit to the Tararuas was in November 1847, and his only acquaintance

with the range was on returning from his later biennial visits to Wellington to report to the Church Missionary Society, so (as Bruce Hamlin has pointed out), any reference to localities in the Tararua range can only mean sites near the present Rimutaka Hill roadside.

Colenso habitually referred to the region around Te Kaikokirikiri (Masterton) as the Head of the Wairarapa Valley – not, as one might expect, the area just south of the Mt Bruce saddle. (In Herb. Colenso there is a *Euphrasia* annotated in Colenso’s hand, “*Pterostylis* Swamp near Kaikok”).

The relevant entries in Colenso’s plant list read...

1959. *Pterostylis*, all I have, 2 sps., from head of Wairarapa valley: but compare with 1906. (No.1906 is *Pterostylis foliata*).

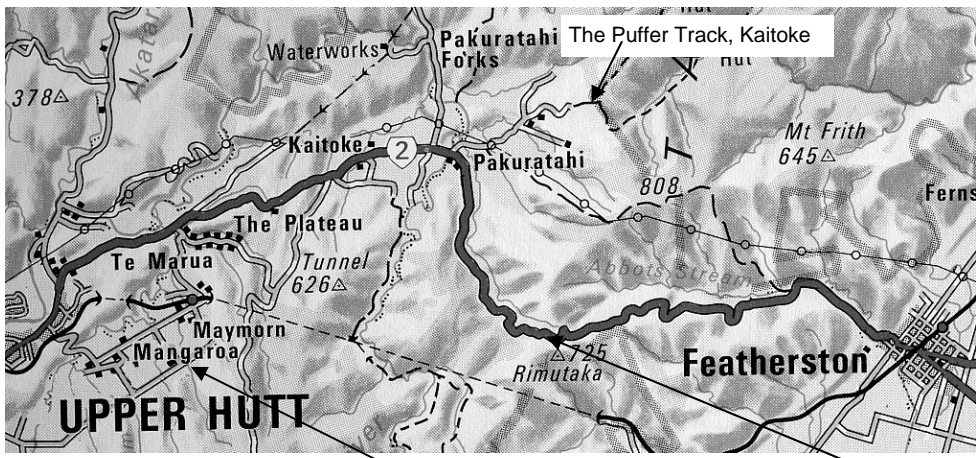
1960. *Pterostylis*, from ditto: perhaps same as 1742.

He had sent packages to Kew in Dec 1846 and Sep 1847, so it is reasonable to assume that it was between September 1847 and July 1848 that he collected the specimens for this package sent in July 1848. Colenso visited the Tararuas only once in that period, in November 1847, though he was again at Te Kaikokirikiri 13-17 April 1848, on his way to Wellington via Cape Palliser.

Extracts from his diary for 1847 read as follows.

4 Nov. Left Pitoone... by the new road leading up the valley of Heretaunga (“Hutt”)... which is densely wooded... halted for the night above River Te Mangaroa....

5 Nov. At 8, a.m. commenced ascending the mountain range, and... about 4 p.m. gained the summit of the range, very nearly to which place the road has been cut... as the evening was fast advancing, we hastened to descend by a miserable



Colenso and his party stopped near Mangaroa, then continued over what is now the Rimutaka Hill Road as far as the summit; their path down to the Wairarapa is unknown, but probably followed Abbots Stream to the site of present-day Featherston

*Native path to the vallies below... through thick woods, when finding a dry and level spot we halted for the night in the forest.*

6 Nov. *An hour's travelling brought us upon a line of road upon this (the Wairarapa) side of the mountain range; and another hour... to the flat open country of Wairarapa.*

7 Nov. *Lord's Day rested in the wood.*

8-9 at *Huaangarua* (Martinborough)

10 *Te Ahiaruhe* (on the Martinborough-Gladstone road)

10 to *Hurunui-o-Rangi* (the marae at Gladstone, opposite Gladstone and Fairview vineyards)

11-14 *Te Kaikokirikiri* (Masterton)

15 upriver and on to

16-17 *Te Hawera* (between Woodville & Eketahuna)

18 *Ngaawaparua* (junction of the Manawatu and Mangatainoka rivers)

19 *poling upriver to Otawao to Puehutai*

20-21 *Puehutai*

22 *Te Hautotara*

24 *Epairima* (nr Wallingford)

25 *Te Waipukurau*

...and home on 30 November.

Thus Colenso must have collected No.1742 by the Rimutaka roadside on 5 or 6 November

1847 (the "road" was a hazardous track until a six-year improvement was begun in 1853). It seems very likely he collected No.1960 near Masterton on 11-14 November 1847.

Hooker has "East Coast, Col" is a type locality, and this may refer to an earlier specimen sent from Northland. (Importantly, when Colenso referred to "East Coast" in his letters to Kew, he meant the east coast of the North Island – ie, not the modern restricted interpretation of Gisborne/Poverty Bay, nor even east coast lower North Island (the Wairarapa coast) but the whole eastern seacoast from North Cape to Cape Palliser, including Bay of Plenty. He wrote to Hooker in 1854,

*As to the giving of "E. Coast" as a hab. for many Plants, it might just as well be left out, because several plants are peculiar to different parts (or ½ degrees of lat., if you will), of the E. Coast; I also think, E. Coast would have been better for between this place (i.e. Waitangi, Hawke's Bay) & Cook's Str.*

**Today** the *Pterostylis graminea* that flowers in November on clayey hills in the Tararuas near the Rimutaka Hill road is that illustrated as **Figs.1-4 (IFC)**, photographed by the Puffer trackside, Kaitoke, on 3Nov08. Brian Molloy says it is a good match for Colenso's type.

# Far North diary: Kevin Matthews

**15** SEPTEMBER. A few pix from Te Pahi on a recent trip with Anne Fraser, Maureen Young, Jeremy Rolfe and Bill Campbell – a most successful trip in the way of open flowers. Anne had the pleasure of introducing me to my Great Great Uncle's *Thelymitra* – thank you Anne. She asked me to capture on film the wee calli (residual post-anther?) located between the 2 yellow ears like appendages extending out from the column. These vary from plant to plant in number, but 2-3 calli generally. Anne has a reference from Jones describing them as wart-like on the Aussie *Thelymitra matthewsii*. She pointed out that ours has pointed calli (horn like).\* Note on the axial picture the recess is clearly shown mid-anther (Figs 5-8).

My *Linguella puberula* is flowering at the moment – there are 100s in the colony but only a few will flower – will send pix, it's a hard one to photograph. I wondered if the bent-back floral stance was typical of the species? (Fig.9).

**22** SEPTEMBER. I photographed *Pterostylis tasmanica* yesterday (Figs 10, 11); interestingly the labellum on one flower was still lying along the horizontal lateral sepals fully exposing the stigma. The U shaped callus tip of the labellum had a “leg” located in each lateral sepal as if it was designed for the purpose. I revisited the flower an hour later and the labellum had released to the normal arch position, possibly due to heat or vibration. I will revisit the site to see how long it takes before the lateral sepals drop down; of the 2 flowers open both had forward pointing lateral sepals. I'm also interested in a yellow “disc” to the rear of the labellum which on first thoughts appeared to be a disc of pollen. (Later: I can confirm that is what they are: other flowers also dumped their clumped pollen in the flower.

Bill Campbell found the *P. tasmanica* colony not 25 metres from my *Linguella puberula* colony; we reckoned there was a

good chance of turning it up in the vicinity of *Linguella* and sure enough it was there.

This area is turning up some good stuff with a good number of yellow *Thelymitra carnea* and also a large form of *T. carnea* (Figs 12-15). The structure of the plant must be a throw back to the Australian parents. It has variable U channeled leaf up to 500mm long, peduncle height of 450mm and still growing. Up to six flowers, 20mm when open. The flowers are definitely *T. carnea* but the overall structure of the plants belies this fact. Given that *T. pulchella* is so variable one could or should expect some variability in *T. carnea*; however *T. carnea* has (in the past) always presented itself consistently.

**28** SEPTEMBER. The hairy labellum on the *Plumatichilos tasmanicum* (Fig.16)

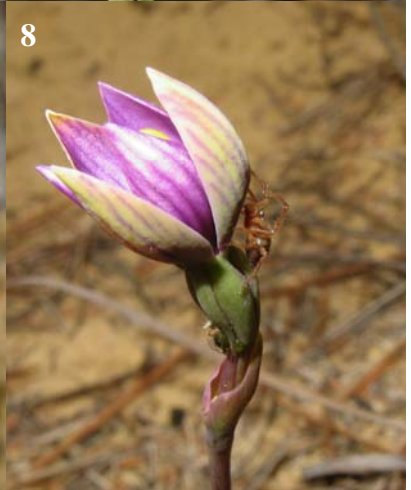
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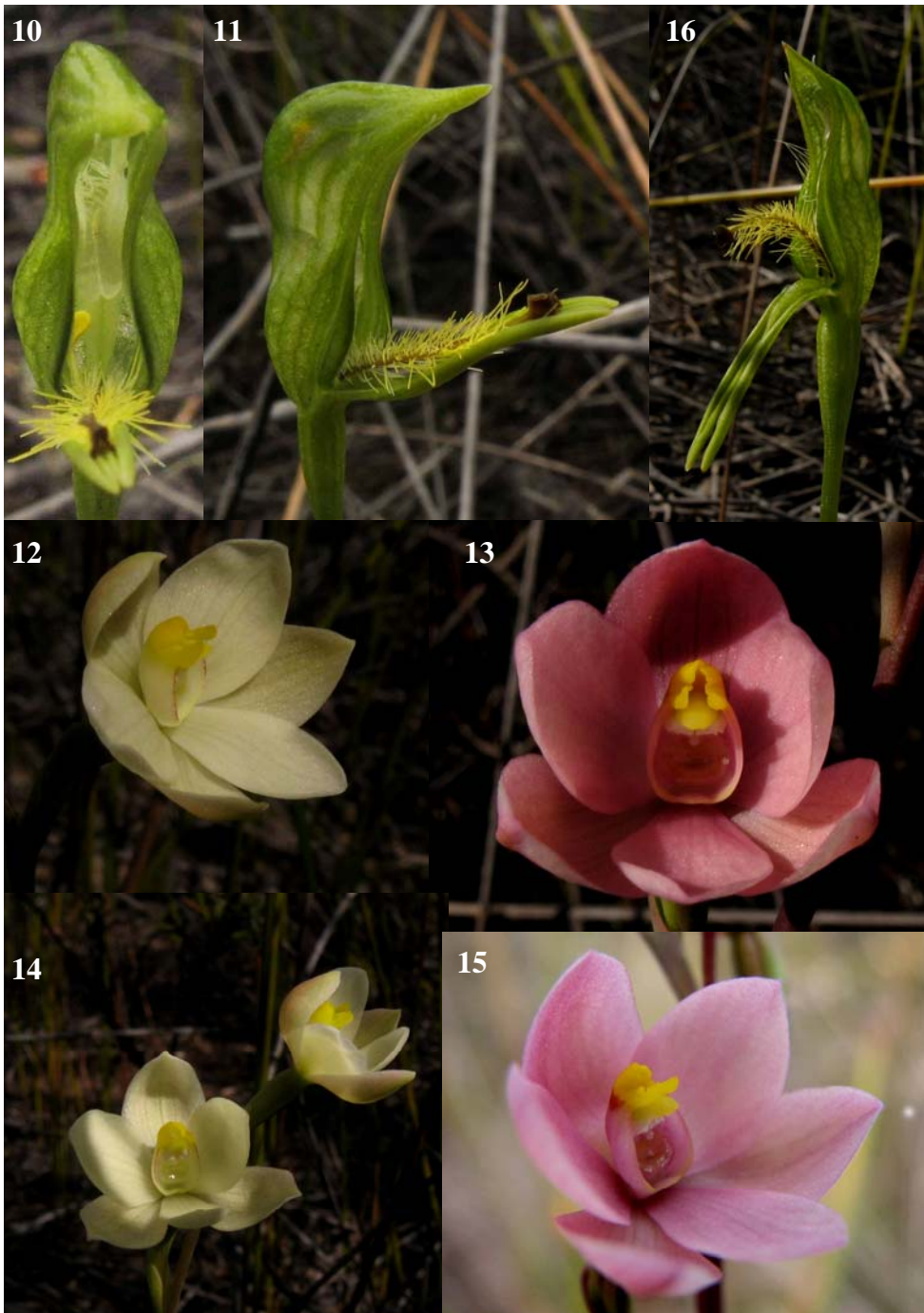
\* Anne Fraser wrote, “Cheeseman [1] said in his ‘new species description’ 1910, that the column was not produced behind the anther. There were ‘occasional evidences’ of a slight crest connecting the column arms at the base. He also observed that *T. matthewsii* differed from *T. variegata* in Australia in the column wing ‘scarcely crested on the back behind the anther’. Jones 2006 [2] said, ‘post anther lobe short sometimes notched with dense grape-like cluster of globose glands’. In his 1993 [3] edition he had used the same description and added that it was ‘sometimes flanked by short accessory lobes’. Interestingly, Rogers 1930 [4] describing *T. matthewsii* as *T. D’Altonii*, the original species name in Australia, wrote ‘middle lobe much shorter or obsolete without any dorsal crest’.

1. Cheeseman, T.F. 1910. New Species of Plants. Transactions New Zealand Institute 43: 177-8.
2. Jones DL. 2006. A Complete Guide to the Orchids of Australia including the Island Territories. Reed, Australia.
3. Jones DL. 1993. Native Orchids of Australia. Reed, Australia.
4. Rogers RS. 1930 Contributions to the Orchidology of Papua and Australia. *Trans.R.S.South Australia*. 54: pp37-46.

See also Anne's abstract in this issue—Ed







may be a freak... need to see more of a cross section. The *Thelymitra carnea* var. (large form) is quite happy to open flowers.

**26** OCTOBER. Its been a pretty good year for orchid up this way so far with *Thelymitra* flowers opening in less than perfect weather. The scented *T. pauciflora* attached (**Fig.17**) shows close similarity with *T. sancilia* with deep cleft....however as you know the cleft is far more pronounced on *T. sancilia*. This one also has 2 in-turned fingers on the postanther lobe. The postanther cleft margin is very in-rolled making it appear blunt in the picture. I have this same form growing on the farm here just north of Kaitaia, it also sports the red saddle and in-turned postanther fingers but I've never been lucky enough to catch it open. Here at home it's growing in open areas under tall kanuka and is associated with *Chiloglottis cornuta*; the substrate is silica sand. Out at Otangaroa Forest, which is south west of Mangonui, it's growing track side in heavy clay.

The wee 90mm *Microtis arenaria* (**Fig.18-21**) is growing out on the Tauroa Pen. Ahipara. The flower including the ovary measures a mere 4-5mm which makes them rather hard on the eye! These could easily be overlooked as poor specimens of *M. unifolia*. The notch on the labellum tip of this colony is not pronounced and is somewhat variable, however all sport the back turned (in-turned) apiculus at labellum centre tip; the detail of which can be just seen in the attached pic. The humpback form of the ovary is another clue that draws the eye. It's growing in a dry open area under kanuka along with *Thelymitra* aff. *longifolia* and a wee colony of *Caladenia* "nitidoa-rosea" (which was another pleasing find).

The *Plumatichilos tasmanicum* (next column) opened the flower on the 21Sep08, on the 12Oct08 the lateral sepals were still at their downward position. When I returned to the site on the 23Oct08 they were drawn up as depicted. This means it takes at least 3 weeks

for the lateral sepals to draw closed. The swollen ovary looks very much pregnant!

Finding a self opened *Thelymitra* "rough leaf" (**Fig.24**) was a real bonus on a recent outing in the Ohia area. Another (**Fig.25**), right alongside, lacked the V in the postanther lobe.

I have an intriguing *Prasophyllum* with long tapered ovary and single finger-like column arms lacking the usual "2 point ends" on the go at the moment; nothing here quite matches but would be closest to *P. "Tohanga"*.

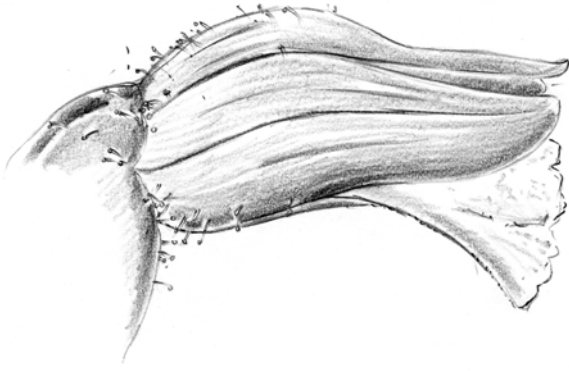


**24** NOVEMBER. *Thelymitra pulchella* variations... (**Fig.22, 23**).

**25** NOVEMBER. Kevin sent the photographs of a *Thelymitra* with an orange post-anther lobe (**Figs.26, 27**). I (ed.) have been calling this plant "*Thelymitra* aff. *brevifolia* Jeanes" for want of a better name, and suggested to Kevin that his plant might have short leaves. He replied, "I cannot find a description as yet for Au *T. brevifolia*. I imagine that the postanther margin is in-rolled on *T. brevifolia* to have been placed in *T. pauciflora* originally. To compare this to the similar NZ form one needs to know if the southern lot has a blunt p.a or in-rolled. This wetland form has a blunt p.a margin with no column shoulder. The leaf on this wetland *T.* 'orange' p.a is similar to the smaller plants of *T.* 'Ahipara' and they are difficult to tell apart without checking out the flower. The larger robust *T.* 'Ahipara' have a fleshy closely folded leaf which I guess refers to Peter's description of succulent and *Ixia*-like. Getting back to your question: is the leaf short? It is of average length for *Thelymitra*."

# Elementary: ED Hatch

## 20. Miscellaneous terrestrials 9



Drawings by Bruce Irwin  
and Matilda Smith

### *Spiranthes*

(the flowers spiralling round the spike)

A very wide-ranging genus of swamps and bogs

### **25: *Spiranthes novae-zelandiae***

(of NZ)

Leaves ± in a basal rosette, flowers pink or white

**Distribution** – endemic – North, South, Stewart and Chatham Is.

**Flowers** – December-February – self pollinated



## ***Townsonia***

(for William Townson)

A rhizomatous genus of 2 species; one, *T. viridis*, in Tasmania, one in NZ

### **26: *Townsonia deflexa***

(the deflexed lateral sepals)

Petiolate leaves rising from the rhizome, and a sessile leaf about half-way up the flower-stem

**Distribution** – endemic – North Id., Mount Ruapehu and Tararua Range., South, Stewart, Auckland and Campbell Is.

**Flowers** – November-January – self pollinated



*Townsonia deflexa*  
Drawing, Matilda Smith

## ***Waireia***

(from the Maori, the wet peat habitat)

### **27: *Waireia stenopetala***

(the narrow petals)

An endemic, monotypic genus, erroneously included in *Lyperanthus* and *Thelymitra*

**Distribution** – endemic – southern North Id., Stewart, Auckland and Campbell Is.

**Flowers** – November-March – self pollinated

# Eponymous orchids: Val Smith

Richard Henry Matthews (1835–1912)

*Thelymitra matthewsii* Cheesem.

Born at Kaitaia in 1835, Richard Henry Matthews was the eldest in a family of six, and the second pakeha child born in the area. His father Joseph had arrived at the Bay of Islands in 1832, and the following year, with William Gilbert Puckey, established a mission at Kaitaia; his mother Mary Ann was a daughter of missionary-farmer Richard Davis of Waimate. At first, the older children at the mission were taught to read and write by their parents, but when the services of a “Cambridge man” became available in 1843, a school was opened with three pupils. There, after completing his primary course, Richard Henry got a thorough grounding in the classics and later, botany. He hoped to be ordained – but that was not to be!

In 1860 Matthews married Clarissa Isabella Dunn from the Oruru mission near Mangonui, and family responsibilities ruled out theological studies. However, his father had been granted land, and for a few years Richard grazed sheep and cattle on the farm known as Mangawhero, and also ran the first Kaitaia Post Office from his home. In 1864 he was appointed superintendent of native schools in the far north, but due to lack of attendance these closed after five years. A search for gold in Waihi, and a flax-milling venture both failed, and his father despaired – but Richard Henry became a successful builder, and also gave long service on many local committees.

In 1893, when he was 58, an exciting new phase in his life began. Harry Carse was appointed to the Kaitaia School, and although he was 22 years younger than Matthews, the two men became good friends and pursued a mutual interest in native plants. At the end of 1896, Matthews wrote the first of 113 letters to Cheeseman, enclosing an orchid for identification and a list of over 80 varieties of ferns they had collected in the vicinity. When teaching appointments took Carse elsewhere, Matthews continued collecting, often enlisting the help of his Boys (always written with a capital “B”), and bombarding Cheeseman with specimens, observations and questions. He concentrated on orchids, finding many rare and unusual species, but also extended the known range of numerous other plants. In his last letter to Cheeseman in March 1912, he gave information on the use of taraira and hinau fruits, and added, “Am in a parlous state, heart given out, dropsy from toes to breast, helpless. Kindest regards, R H Matthews.” He died two months later, aged 76.

A late starter in the field of botany, Richard Henry Matthews was an avid collector and seeker of knowledge, and our first New Zealand born botanist. His work was carried on by his eldest son, Harry Blencowe (Blen) Matthews, and Harry Carse, and his name is commemorated in the sun orchid, *Thelymitra matthewsii* found by the Boys near Lake Tangonge in 1909, and a native forget-me-not, *Myosotis matthewsii*, collected near Kaitaia in the late 1890s.

See Figures 5-8.



# Australian notes: David McConachie

## 31st August Bushwalk Report – Harvey Bay

By Graham Corbin Kalhari Sep. 2008 pp31-36

This month had a change of venue from the advertised bushwalk. Five KABI members joined 23 Harvey Bay OS, Childers OS and Maryborough OS members for a bushwalk in the Harvey Bay area. While this was quite a drive with the southside members leaving home shortly after 5am, it was well worth the early start with some very beautiful and unusual orchids found in flower.

The fun started at the meeting place on the highway near Maroom. Those who got there early immediately found numerous *Microtis parviflora* growing in the roadside drain with virtually all in bud and quite a few with open flowers. Those new to our local native orchids were surprised that these were indeed orchids and the tiny size of the flowers, too small to appreciate with the naked eye being only 2 to 3mm wide. With the success of orchids next to the cars, off we chugged into the low heath and were soon rewarded with more plenty more flowering *Microtis parviflora*. Nearby, we found numerous *Thelymitra* all in flower but with the flowers still closed. These orchids, commonly known as sun orchids, only open their flowers on warm sunny days and at 8:30am, it was just too early to expect the flowers to be open. A single flower of *Caladenia fuscata* was found, but this flower was very old and quite damaged.

A bit more searching revealed a *Cryptostylis subulata* in flower. This interesting orchid commonly known as the tongue orchid had 3 open flowers with 3 buds yet to open. This is one of our few evergreen terrestrials with a single gumleaf like vertical leaf. There were dozens of plants in the area as shown by the abundance of the leaves, but only one plant was in flower. Interestingly, unlike most orchids, the flower faces the flower stem, so most people new to this species study the back

of the flower rather than the face. By this stage, all those attending had arrived, so with the success of our ‘unofficial’ orchid stop, we moved on to the first official stop with the promise of yet more orchids.

We next walked through an area of light tree cover with a sparse grassy understorey. We soon found numerous examples of fresh *Caladenia fuscata*. This beautiful species is one of the smaller *Caladenia* and can be identified by the pink flower colouration with red stripes on the column and labellum and the labellum tightly embracing the column. Nearby, we found two *Dipodium variegatum* in flower. One of a number of *Dipodium* species in Australia, this species can be instantly identified by the purple spotting extended to the pedicel.

Further down the track were a few flowers of *Glossodia minor*, a lovely blue purple flower. There are two species of *Glossodia*, both restricted to Australia and both found in the area, the other being *G. major*. Both have quite similar flowers, but can be separated by the labellum, with *G. minor* having a small rounded labellum and *G. major* having a much larger pointed labellum. Unfortunately, none of these flowers were fresh with all showing some degree of damage but were still very nice to see. The flowers did show interesting variations in the labellum basal callus colour. This callus is usually purple with a yellow base, but one flower had an almost totally yellow callus. Very interesting. The walk back to the car revealed hundreds of *Pterostylis* rosettes, possibly *Pterostylis baptistii* from the leaf size and shape. Many rosettes showed spent flowers, but none had identifiable flowers.

Next, the group moved on for a tour of the thriving town of Maaroom, a typical blink and

you will miss it seaside village. We made a brief stop at the district hall to search for *Spiranthes sinensis* growing in the lawn. These usually flower from November to April and we could find no sign of their rosettes, maybe too early for them to emerge. We did however find a thriving colony of *Microtis parviflora* growing and flowering in the lawn.

A short drive away, we found our first *Diuris alba*. This beautiful white donkey orchid with purple markings proved to be very difficult to photograph with its tall slender stem swaying wildly in the wind. This was only the first of this orchid we found with dozens more found along the side of the road. This orchid seemed to prefer the wet areas in drains and low lying areas and was quite common in these areas.

A shout from nearby revealed yet another orchid, this time a *Thelymitra* fully open. Nearby where yet more of this orchid which were later identified as *Thelymitra pauciflora*. Large numbers of this orchid were found all down the road. This beautiful orchid was indeed very common in this area. Further down the road, another very similar but subtly different orchid was photographed. While it looks identical at first glance, it is a different species, *Thelymitra nuda*. These two species are virtually identical but can be separated by *T. nuda* having larger flowers and straight column arms while *T. pauciflora* has smaller flowers with bent column arms.

Continuing walking down the road revealed large numbers of another similar looking *Thelymitra*, this time *Thelymitra purpurata*. The beautiful blue flowers of this orchid contrast nicely with the yellow tip to its column.

Continuing down the road revealed a large number of *Prasophyllum elatum* growing in a low lying wet area. These large orchids have flower spikes over 1m tall with over 50 flowers on a spike. These orchids generally prefer swampy areas and these orchids obviously had found a suitable wet area.

By this time, time was running very short, so we reluctantly set off for our next stop. Here we found hundreds of *Dendrobium tetragonum* growing on the Melaleuca trees. We unfortunately did not find any of these orchids in flower, but we found plenty of

spent flowers no more than a couple of weeks old. It was quite interesting that these orchids showed a distinct preference for the Melaleuca trees as we found none growing on any of the other trees in the area.

We then moved onto our lunch stop where we enjoyed lunch together discussing the orchids we had seen. We all agreed that the day had been a wonderful success both with the large number of members from the four different societies who attended and the large number of interesting orchids seen. Hopefully, the next Orchid walk in the area won't be too far away.

### The New Zealand Native Orchid Journal

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THE EDITOR, THE EDITORIAL BOARD AND THE GROUP MAY NOT SHARE AUTHORS' OPINIONS.

# Notes etc

ANNE FRASER WROTE, “**Orchids on Safari in Madagascar.** A somewhat sudden decision to join a group on a trip to Madagascar saw Maureen Young and me part of a small safari, flying to Johannesburg and Antananarivo (known locally as Tana) the capital of Madagascar, at the end of June and into July.

I had always wanted to go to Madagascar to see lemurs and enjoy the wonderful orchid flora of that legendary continental island.

It was too early in the year to see most species in flower although a handsome specimen of a winter flowering *Angraecum*, in flower in a pot, was photographed at one of our hotels. On our first walk near the Ambositra area, large clumps with clustered pseudobulbs which suggested a *Bulbophyllum* species, were seen along the branches of low trees in a shrubby forest on the slope of a granite escarpment. The first terrestrial species I saw were here in seed among grasses, and another later, a rosette of pointed leaves and stem also with a seed pod, on a bank above the river at Ranomafana. At Tsaranoro in the Lemur habitat reserve, the orchids were more lithophytic among rocks, and were robust plants with leafy stems and aerial roots. Several epiphytes were noted especially at Ranomafana.

At the Arboretum the Madagascan endemic leafless vanilla, plastered its thick photosynthetic stems up small dry trees. An orchid that looked like a clump of grass caught my interest there. We saw the commercial vanilla *V. planifolia* trained up pollarded trees at the spice farm and at the east coast, at Mananjary, ate lunch facing the Indian Ocean, where the warm breeze carried the sweet scent of vanilla pods, drying in the sun on a small table nearby.

An interesting association was the orchid species seen in a niche in a scherophyllous elephant's foot plant (*Pachypodium sp.*) high on Chameleon mountain, a huge granite

massif above our camp at Tsaranoro. On the trek into the canyon in sandstone buttes near Isalo, a tiny orchid on a slim branch, had tiny open flowers on a spray below the two fleshy leaves. This was dry shrub land and one other terrestrial species was photographed there, and another lithophytic plant was seen near the stream.

No orchids were observed in the spiny forest among the baobab trees at Ifaty on the west coast. Apart from the orchids, the many plant species were wonderfully interesting and the affinities with genera from our flora were fascinating and at times surprising.”

MICHAEL PRATT EMAILED, “I've finally finished the rebuild of the orchid website. It took about 2 months longer than I anticipated. I added up the number of pages the other day, it turns out there are 798, so it's not surprising it took so long to recode them all.

“I've added additional photos, increased the descriptions of each species, and made several other improvements.

“It's been tested at various screen resolutions in Internet Explorer 6 & 7, Firefox 1, 2, & 3, Apple Safari, Opera 9, and Google Chrome, plus every page has been validated as error free XHTML 1.0... so hopefully it won't have too many rendering issues.

“The original website can still be accessed as I've placed it into a sub folder. It shares most of the photos etc with the new site, so it only uses about 7MB of space on the server. It can be accessed by clicking a link at the bottom of the pages that says ‘Change to narrow width website’ (I copied the idea from Xtra's website). That will accommodate the people that still use the small 800x600 screen resolution, though I'm no longer going to keep it updated.

“The new site isn't likely to win a ‘Webby’ award, but hopefully it's acceptable to the

NZNOG.”

*It's simply stunning. Michael has put NZ orchids on the map using the most modern and powerful of media. Take a look—at website <http://www.nativeorchids.co.nz/> —Ed.*

VIC VERCOE EMAILED the nice shots of *Petalochilus chlorostylus* and *Petalochilus* aff. *chlorostylus* shown in **Figs. 28 and 29** on 24 November. The shape is almost exactly the same, but those red papillae on the dorsal sepal are striking.

GORDON SYLVESTER EMAILED (23 November), “If the weather gods are anywhere kind I will usually stop and have a look at various parts of the roadside while travelling to or from Christchurch. Generally this results in extending a range of a genus or species. But occasionally a searcher will get lucky. Recently Thom Pendrigh of Oxford told me about the site of a *Nematoceras* on S.H. 73. I decided on my next trip to look at this site and see if anything was visible. About a week later Steve Reekie emailed a photo of a *Nematoceras* he had found at Arthurs Pass. This piqued my curiosity even more. My partner and I were due to travel to Ch’ch for a function on 21 Nov. I decided to stop briefly at Thom’s suggested site. We parked the ute and I disappeared into the scrub and spotted some small florets of *Pterostylis oliveri* and a few *N. macranthum*-like leaves with the occasional trilobate leaf as well. My partner called out that she had found what she thought might be an orchid. She sure had (**Fig.30**). On our return home on Saturday I emailed several members with a copy of the digital photograph. Mark Moorhouse thought it resembled a find of his from Mt Arthur at the same altitude. It was found at 840masl under light *Dracophyllum* scrub on a scree slope with a light covering of humus. What is remarkable is the depth of colour. Oh and by the way there were several other plants with flowers in varying stages. All had the purple pitted margins to the edges of the leaf.” *It has a very long, but rounded dorsal sepal,*

*suggesting (to me) a hybrid between N. trilobum s.s. and perhaps N. macranthum or a late-flowering member of the N. rivulare aggregate —Ed.*

PHIL NORTON EMAILED from Blenheim (13 Oct), “It has been a while since you last walked the Rarangi track. I went a bit earlier this year to try to catch some species that I usually miss in November. I found a rather nice *Cyrtostylis rotundifolia* and a community of this strange looking flower (**Fig.31**). The leaf is similar to *C. rotundifolia* and it looks like some sort of *Cyrtostylis* but like nothing I can find in the field guide or on the NZNOG web site. No doubt you can pin a tag on it for me. *Your confidence is touching Phil. The lower ovary has swollen and the flower has wilted. The upper flower is hard to discern from the photograph, but the dorsal and the labellum look too narrow for rotundifolia, as you say. It looks rather like C. huegellii, as David Jones has it illustrated (A complete guide to Native orchids of Australia, p.163).—Ed.*

MEXICO IS COLOUR. Vivid, vibrant, vital. A culture as old as Egypt, but with issues we can relate to – the tension of being next door to a powerful, rich country; and a postcolonial biculturalism (Spanish and indigenous peoples) more fraught than ours. Orchids are unusual in autumn, so I didn’t make any special arrangements to see Mexican orchids, but I should have – they flower all year in that delightful climate. There were tantalising glimpses from the bus as we wound our way through the southern central highlands of Chiapas between Palenque and San Cristóbal de las Casas: I could identify the crucifix orchid (*Epidendrum* sp., **Fig.32**) in flaming dozens, but not the very few, big-as-your-hand, solitary pink flowers, high up on the roadside banks, out of reach of collectors—Ed.

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Journal are now available and may be accessed at <http://culturesheet.org/wiki:user:nanoj:start>.

MARK MOORHOUSE EMAILED (12 November), “Just a follow up on Val Smith’s well written and informative article on John Robertson. Her last statement regarding *Calochilus robertsonii*, ‘but in New Zealand is confined to a few sites in the central North Island, where it’s survival is at risk’, is perhaps a little misguided by the presently available map in the current Field Guide. Nelson’s Takaka Valley has quite a strong representation of this species. A couple of weeks back they were in full flower, (Fig.33, 34) and at least 30 plants were mixed with the more plentiful *Calochilus paludosus* on one of the better sites. The latter will be in flower about now and for a fortnight or so.

“There are also present a large number of *Thelymitra* and one of these species has extraordinarily long bracts and will not open until about the middle of December. Is it possible to find a natural hybrid between *Thelymitra* and *Calochilus*, as I see from Murray Dawson’s article [NZNOJ 110 p. 26] that they are closely allied genetically?”

“Another interesting plant found by Nelson’s recently awarded DOC officer Shannel Courtney was a *Singularibas oblongus* colony with salmon pink flowers. Good spotting Shannel, and most impressive. Perhaps you would like to share a photo with us in the journal?”

“News on the *Linguella puberula* in Golden Bay is that we now have managed to locate just on 600 plants this season in a circle over a mile in diameter after several days of scrub bashing. Quite a pleasing result as no doubt we didn’t find every colony.”

STEVE REEKIE EMAILED, “I was up at Arthurs Pass on Sunday 2nd of November with Murray Cave and Elizabeth Passuello photographing Kea. Whilst we were in the village, Murray and I followed a small stream behind the Outdoor Education Centre to a small waterfall at about 780-800m altitude. On

a regrown slip, in a shady, sheltered corner of the narrow steep sided gorge, I found a small colony of orchids, which I took from the leaf shape to be of the *Nematoceras trilobum* aggregate. Only a couple of these were in flower, and I managed to get a couple of reasonably good shots (Fig.35) using a Raynox DCR150 macro lens on my trusty Lumix FZ8. I was immediately struck by the colour tones of the little beauty, and on my return to Greymouth, promptly accessed the NZNOG website to try and ascertain its identity. The most similar one I could find, to my untrained eye, was *N. pygmy*. I immediately wrote to Eric Scanlen for a second opinion.” Eric replied, “*There is indeed a resemblance but it is quite out of the June-July flowering time for N. pygmy. Thom Pendrigh put us onto a colony at Arthurs Pass where there was leaf only on 2 Dec 2002 at the back of a parking area overlooking the famous viaduct, so it is a revelation to see, possibly the same taxon in flower in Steve’s excellent photos*”.

WHAT WERE THE curious *Pterostylis* we found on the Sunrise hut track in the Ruahines on 6 December, illustrated on the **outside back cover**? Brian Molloy emailed (in response to my question, “Your specimen is a good fit for *Pt. areolata*. No question about that....There is variation from region to region in size and basic coloration (see Fig 23 Johns & Molloy for a small green one). Leaf length (largest leaf) ranges from 2cm Port Hills to 10cm, also in Port Hills but in forest not grassland. See J99 for earlier report—Ed.

THE OUTSIDE BACK cover also shows Eric Scanlen’s stunning photograph of a **highly coloured *Pterostylis irsoniana*** near Triplex Hut in the Ruahines.

IF YOU WOULD like to see your photographs published in a new threatened plant book—ie, of *Anzybas carsei*, *Calochilus herbaceus*, *Linguella puberula*, *Plumatichilos tasmanicum*, *Pterostylis micromega*, *P. irwinii*, *Thelymitra matthewsii*, *T. sanscilia*—please email [jsawyer@doc.govt.nz](mailto:jsawyer@doc.govt.nz), by 30 Jan.

## Edwin Daniel Hatch Memorial Medal appeal

The New Zealand Native Orchid Group intends to strike a medal in memory of Dan Hatch, who made very important and unique contributions to our knowledge of native orchids over a long period, and who encouraged many of our current generation of orchid enthusiasts.

The medal, to be known as the Hatch Medal, will be awarded annually to the person who, in the opinion of the Group's Executive, made the greatest contribution to New Zealand orchidology, as defined in the Group's aims.

Donations are invited from anybody enthusiastic about recognising Dan Hatch and potential recipients in this way.

A total of \$1000 is sought.

Donations should be sent to Judith Tyler, Treasurer, NZNOG, 4 Byrd St, Levin.

## Orchids in Black & White

Fifty important monochrome halfplate photographs of NZ native orchids  
by HB Matthews.

# 17 in the NZNOG's *Historical Series*.  
Available: \$22 in NZ, from Brian Tyler,  
bandj.tyler@xtra.co.nz.

## Colour Field Guide

A new colour field guide is in preparation and should be available early in 2009. It is written by Eric Scanlen and Ian St George, and will cover all the described and significant tagged and undescribed taxa so far identified. The inclusion of undescribed taxa will publicise these orchids, in order that others may recognise and conserve them.

## Arthurs Pass ~ an alpine paradise: book now!!

The most travelled route to the West Coast! For the amount of traffic very few people stop and investigate the orchids. Only a couple of lists have been published in scientific journals as well as in our own journal.

For the adventurous souls in the group, we are planning a 3-5 day camp based either at Arthurs Pass or nearby, and will explore the Waimakariri River headwaters, the Bealey River and any other place that takes the fancy of the group.

Because of the remoteness of the location, we suggest the participants meet at Christchurch, hire minibuses for say a week and drive to the venue.

We will need to take in food supplies as there is no convenient shop within an hour's drive. The same could be said for alcohol although there is a hotel at Bealey.

This means several decisions need to be made soon....

- How many are prepared to come down?
- What is the cost of hire of the minibuses?
- Cost and purchase of sufficient food for the party.
- ...and the hire of a place to sleep.
- Crockery may well be required.
- There is a YHA Hostel available.
- But there may well be other accommodation available too.
- Anyone coming will have the cost of transport to Christchurch as well.

Finally it is alpine and likely to snow at any time of the year. The same goes for rain. You may experience all climates in one day.

What plants are there? see *Journal* 110 for a list for most of the area we would visit. But that is not a definitive list by any means.

If this type of adventure tweaks your imagination please contact Gordon Sylvester either by email or snail mail to register your interest. When I have a better handle on actual costs we can then firm up a proposal for the participants to decide on.

Email [southcol@xtra.co.nz](mailto:southcol@xtra.co.nz) or Gordon Sylvester, OTA 609, Kumara 7832 (it is vital you detail the address exactly as my mail ends up in some interesting places for a couple of weeks until someone sorts out the correct post code etc).

# Mapping Scheme: Gordon Sylvester

Since the last update there have been several new records added from our *Journal*, publications from DoC, and other sources. One source has been records available on the internet from scientific and botanical journals authored by field botanists. As these are public records they have been incorporated in the database.

A revision of the records disclosed some errors which are now corrected. However should any of the deletions prove to be spurious it is an easy matter to reinsert them.

I am always on the lookout for “new” information even if you think it is old information. You are the only source of information available to us all. What is common in your patch is not known to everyone. There are a lot of gaps where a particular species should be located, given that surrounding districts may already have a “complete” list. This is a fluid exercise; you never know what will suddenly show up and just as suddenly disappear for several years.

Having a map (Freshmap), along with a set of maps showing the actual ER and ED boundaries available with the database, has made the task of assigning an Ecological Region to a record much easier, especially where the person recording it made reference to an actual location. I have been able to correct some entries that were inappropriately assigned in the past. This has meant a rewrite of the entire database and the maps. All names conform to those recorded in *Journal* 105 and include all records to *Journal* 108.

Several sources of new information have arisen, principally a list from Mark Moorhouse. This source had not been published previously. My thanks go to Mark for the additional information.

I understand that there is a new publication in the wings which may add some new information to the database.

Nothing more needs to be said, other than, this now updates the database to *Journal* 105; we have a total of 4500 cross referenced locations in the database.

*Acianthus sinclairii*: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 29, 31, 35, 36, 37, 38, 39, 40, 46, 47, 48, 72, 73, 79, 80.

*Adelopetalum tuberculatum*: 4, 5, 6, 9, 10, 11, 12, 13, 14, 19, 25, 31, 38, 39, 46.

*Adenochilus gracilis*: 16, 17, 18, 19, 20, 21, 25, 29, 30, 36, 38, 40, 43, 46, 47, 48, 49, 50, 51, 53, 54, 59, 66, 68, 69, 70, 72, 73, 74, 77, 79, 80.

*Anzybas carsei*: 11.

*Anzybas rotundifolius*: 3, 4, 5, 6, 9, 33, 80.

*Aporostylis bifolia*: 10, 13, 15, 17, 18, 19, 20, 21, 23, 24, 25, 26, 28, 29, 33, 38, 39, 40, 43, 46, 47, 48, 49, 50, 51, 53, 59, 61, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 77, 78, 79, 80, 83, 84.

*Calochilus herbaceus*: 3, 4, 5, 8, 9.

*Calochilus paludosus*: 4, 5, 6, 10, 11, 13, 38, 46, 47, 48.

*Calochilus robertsonii*: 10, 11, 13, 15, 16, 17, 22.

*Chiloglottis cornuta*: 3, 4, 5, 6, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 35, 36, 37, 38, 39, 40, 42, 43, 45, 46, 47, 48, 49, 50, 51, 53, 54, 55, 56, 57, 59, 61, 63, 65, 66, 68, 69, 70, 72, 73, 74, 77, 78, 79, 80, 83, 84.

*Corunastylis nuda*: 6, 9, 10, 12, 15, 8, 20, 21, 22, 23, 24, 25, 29, 30, 31, 35, 37, 38, 39, 40, 45, 46, 47, 48, 49, 50, 57, 61, 62, 65, 66, 73, 78, 79.

*Corunastylis pumila*: 3, 4, 5, 6, 9, 10, 11, 12, 13, 16, 21, 39, 40, 46.

*Corybas cheesemani*: 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 16, 17, 20, 24, 25, 31, 35, 36, 37, 38, 39, 40, 46, 47, 48, 80.

*Cryptostylis subulata*: 4.

*Cyrtostylis oblonga*: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 38.

*Cyrtostylis rotundifolia*: 3, 4, 6, 9, 10, 11, 12, 16, 20, 22, 29, 31, 35, 36, 37, 38, 39, 40, 46, 47.

*Danhatchia australis*: 5, 6, 8, 9, 10, 11, 12, 39, 46.

*Diplobium alobulum*: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20, 22, 23, 24, 25, 29, 31, 35, 36, 37, 38, 39, 40, 45, 46, 47, 48, 56, 57.

*Diplodium alveatum*: 39, 46.

*Diplodium brumale*: 3, 4, 5, 6, 8, 9, 10, 11, 12.

*Diplobium trullifolium*: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 20, 21, 22, 23, 24, 29, 30, 31, 34, 35, 36, 37, 38, 39, 40, 46, 47.

- Drymoanthus adversus*: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 19, 20, 21, 22, 23, 24, 25, 29, 30, 31, 35, 36, 37, 38, 39, 40, 41, 45, 46, 47, 48, 50, 52, 61, 65, 70, 71, 72, 77, 80.
- Drymoanthus flavus*: 16, 17, 31, 36, 37, 38, 39, 46, 47, 48, 50, 69, 70, 72, 78, 79.
- Earina aestivalis*: 4, 5, 6, 8, 9, 10, 12, 24, 31, 36, 38, 39, 46, 48, 79, 80.
- Earina autumnalis*: 3, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 46, 47, 48, 49, 50, 51, 57, 69, 70, 71, 72, 77, 78, 79, 80.
- Earina mucronata*: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 46, 47, 48, 49, 50, 57, 66, 69, 70, 71, 72, 73, 77, 78, 79, 80.
- Gastrodia cunninghamii*: 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 30, 31, 33, 35, 36, 37, 38, 39, 40, 42, 43, 45, 46, 47, 48, 49, 50, 51, 53, 54, 55, 56, 57, 58, 59, 61, 65, 66, 69, 70, 72, 73, 74, 75, 77, 79, 80.
- Gastrodia minor*: 5, 9, 10, 12, 15, 16, 17, 18, 29, 31, 38, 40, 41, 42, 43, 46, 47, 49, 51, 55, 65, 66, 68, 72, 78, 79.
- Gastrodia* "long column" agg.: 3, 11, 12, 17, 18, 23, 24, 25, 35, 37, 39, 40, 41, 45, 46, 47, 49, 55, 56, 57, 61, 62, 65, 66, 69, 73, 77, 78, 79.
- Gastrodia* aff. *sesamoides*: 3, 4, 5, 6, 8, 9, 10, 11, 13, 17, 18, 20, 25, 26, 29, 30, 31, 35, 37, 38, 39, 40, 41, 46, 47, 72, 73, 78, 79.
- Hymenochilus tanypoda*: 46, 49, 54, 55, 56, 57, 60, 61, 63, 64, 65, 66, 67, 68, 69, 79.
- Hymenochilus tristis*: 41, 43, 49, 54, 55, 56, 57, 59, 61, 63, 67, 68.
- Ichthyostomum pygmaeum*: 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 16, 19, 20, 21, 23, 24, 25, 31, 37, 38, 39, 40, 46, 47, 48, 50, 61, 71, 72, 77, 78, 79.
- Linguella puberula*: 2, 3, 4, 10, 31, 38, 39, 46, 47.
- Microtis arenaria*: 3, 4, 5, 9, 25, 29.
- Microtis oligantha*: 12, 13, 16, 17, 18, 26, 38, 39, 46, 50, 51, 54, 57, 61, 63, 64, 65, 66, 67, 68, 69, 73, 78, 79, 80.
- Microtis parviflora*: 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 16, 17, 19, 25, 31, 35, 39, 46, 48.
- Microtis unifolia*: 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 31, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, 68, 70, 72, 73, 74, 77, 78, 79, 80.
- Microtis* aff. *unifolia*: 12, 36, 39, 40, 50.
- Molloybas cryptanthus*: 2, 3, 6, 9, 10, 18, 24, 25, 38, 39, 47, 48, 55, 72, 75.
- Myrmecchila trapeziformis*: 17, 31.
- Nematoceras acuminatum*: 3, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 31, 37, 38, 39, 40, 46, 43, 47, 48, 50, 51, 53, 61, 65, 71, 72, 77, 79, 80, 83.
- Nematoceras hypogaeum*: 3, 5, 9, 11, 18, 31, 33, 35, 36, 37, 46, 47, 49, 50.
- Nematoceras iridescens*: 4, 9, 11, 12, 13, 16, 18, 22, 23, 24, 25, 28, 29, 30, 31, 35, 36, 37, 38, 46, 47, 50, 56, 65, 69, 77, 79.
- Nematoceras longipetalum*: 12, 18, 24, 25, 26, 27, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 44, 46, 47, 48, 49, 50.
- Nematoceras macranthum*: 5, 6, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 35, 36, 37, 38, 39, 41, 43, 45, 46, 47, 48, 49, 50, 51, 55, 57, 61, 65, 66, 67, 68, 69, 70, 72, 73, 74, 77, 79, 80, 84.
- Nematoceras* aff. *macranthum* "Campbell": 83.
- Nematoceras* aff. *macranthum* "Chatham": 80.
- Nematoceras* aff. *macranthum* "mactaipo": 35, 37.
- Nematoceras* aff. *macranthum* "mactremolite": 46.
- Nematoceras orbiculatum*: 10, 11, 12, 13, 18, 19, 21, 22, 24, 25, 27, 30, 31, 37, 38, 40, 42, 45, 46, 47, 49, 53, 55, 57, 58, 65, 66, 72, 77, 79, 80.
- Nematoceras papa*: 12, 18, 23, 24, 25, 30, 48.
- Nematoceras papillosum*: 47, 65.
- Nematoceras rivulare*: 5, 6, 25.
- Nematoceras* aff. *rivulare* "Kaimai": 9, 10, 13, 16, 18, 19, 21, 25, 46, 47.
- Nematoceras* aff. *rivulare* "Kaitarakahi": 9.
- Nematoceras* aff. *rivulare* "Mangahua": 9, 18, 30.
- Nematoceras* aff. *rivulare* "Pollock": 9.
- Nematoceras* aff. *rivulare* "rest area": 18, 38.
- Nematoceras* aff. *rivulare* "sphagnum": 18, 46.
- Nematoceras* aff. *rivulare* "Takaka Hill": 46.
- Nematoceras* aff. *rivulare* "whiskers": 6, 9, 11, 12, 15, 18, 23, 24, 30, 39, 40, 42, 46, 47, 48, 49: (see *N. viridis*)
- Nematoceras trilobum*: 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20, 21, 22, 24, 25, 26, 29, 30, 31, 34, 35, 36, 37, 38, 39, 40, 42, 43, 45, 46, 47, 48, 49, 50, 51, 53, 55, 57, 57, 61, 65, 66, 68, 69, 70, 71, 72, 73,

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*Nematoceras* aff. *trilobum* "craigielea": 5, 35.  
*Nematoceras* aff. *trilobum* "darkie": 41, 46, 47, 49.  
*Nematoceras* aff. *trilobum* "green fuzz": 46, 49.  
*Nematoceras* aff. *trilobum* "pygmy": 35, 46.  
*Nematoceras* aff. *trilobum* "pygmy 1": 9, 46.  
*Nematoceras* aff. *trilobum* "pygmy 2": 6, 9.  
*Nematoceras* aff. *trilobum* "pygmy 3": 9, 31.  
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*Nematoceras* aff. *trilobum* "Rimutaka": 9, 23, 24, 36, 38, 39, 40, 47, 49.  
*Nematoceras* aff. *trilobum* "round leaf": 12, 18, 46, 49.  
*Nematoceras* aff. *trilobum* "tiny": 25.  
*Nematoceras* aff. *trilobum* "triaug": 9.  
*Nematoceras* aff. *trilobum* "tribaldy": 77.  
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*Nematoceras* aff. *trilobum* "tricraig": 9, 11, 12, 24, 25.  
*Nematoceras* aff. *trilobum* "tridodd": 9.  
*Nematoceras* aff. *trilobum* "triwhite": 17, 18, 25, 46, 49.  
*Nematoceras* aff. *trilobum* "trijuly": 9.  
*Nematoceras* aff. *trilobum* "trileafbract": 49.  
*Nematoceras* aff. *trilobum* "trisept": 9.  
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*Nematoceras* aff. *sulcatum*: 80.  
*Orthoceras novae-zeelandiae*: 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 31, 35, 37, 38, 39, 40, 41, 46, 47, 48.  
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*Petalochilus calyciformis*: 3, 4/5.  
*Petalochilus chlorostylus*: 2, 3, 4, 5, 6, 7, 9, 10, 12, 13, 14, 17, 18, 20, 21, 22, 23, 24, 28, 29, 31, 33, 35, 36, 37, 38, 39, 40, 41, 46, 47, 48, 49, 50, 57, 72, 73, 77, 79, 80.  
*Petalochilus minor*: 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 17, 18, 21, 23, 24, 25, 27, 29, 35, 37, 38, 39, 40, 41, 46, 47, 48, 49, 50, 55, 57, 70, 72, 73, 77, 79, 80.  
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*Petalochilus* aff. *variegatus*: 9, 12, 13, 17, 18, 25, 31, 35, 37, 38, 39, 65, 69.  
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*Plumatochilus tasmanicus*: 2, 3, 4, 9, 10, 11, 12, 38, 39, 46.  
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- Singularybas* aff. *oblongus*: 80.
- Spiranthes novae-zelandiae*: 3, 4, 5, 10, 11, 12, 13, 15, 16, 17, 18, 21, 25, 26, 28, 31, 39, 46, 48, 50, 56, 71, 80.
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