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The Type Locality

5. The 70 Mile Bush and *Earina alba* Col.

By Ian St George

In 1885 William Colenso described *Earina alba* [1]. The chief difference between this and *E. suaveolens*, he claimed, was the presence of the two crescent shaped calli on the labellum (he contrasted that with what Hooker had written of *Earina*, ie that the disk was "eglandular"), along with smaller size, and flowers that lacked the speckles mentioned in Hooker's description of *E. autumnalis*.

In 1906 Thomas Cheeseman wrote, "Mr. Colenso apparently published his *E. alba* under the supposition that *E. suaveolens* has no glands on the lip, but they are always present" [2]. Cheeseman reinstated *E. autumnalis* Hook.f. for *E. suaveolens* Lindl (Lindley had mistakenly thought *E. autumnalis* was a synonym for *E. mucronata*, so had described the former as *E. suaveolens* [J50]). Thus *Earina alba* Col. is presently regarded as a synonym for *Earina autumnalis* Hook.f., and that species is regarded as variable in size, depending on habitat.

Colenso's description

***E. alba*, sp. nov.**

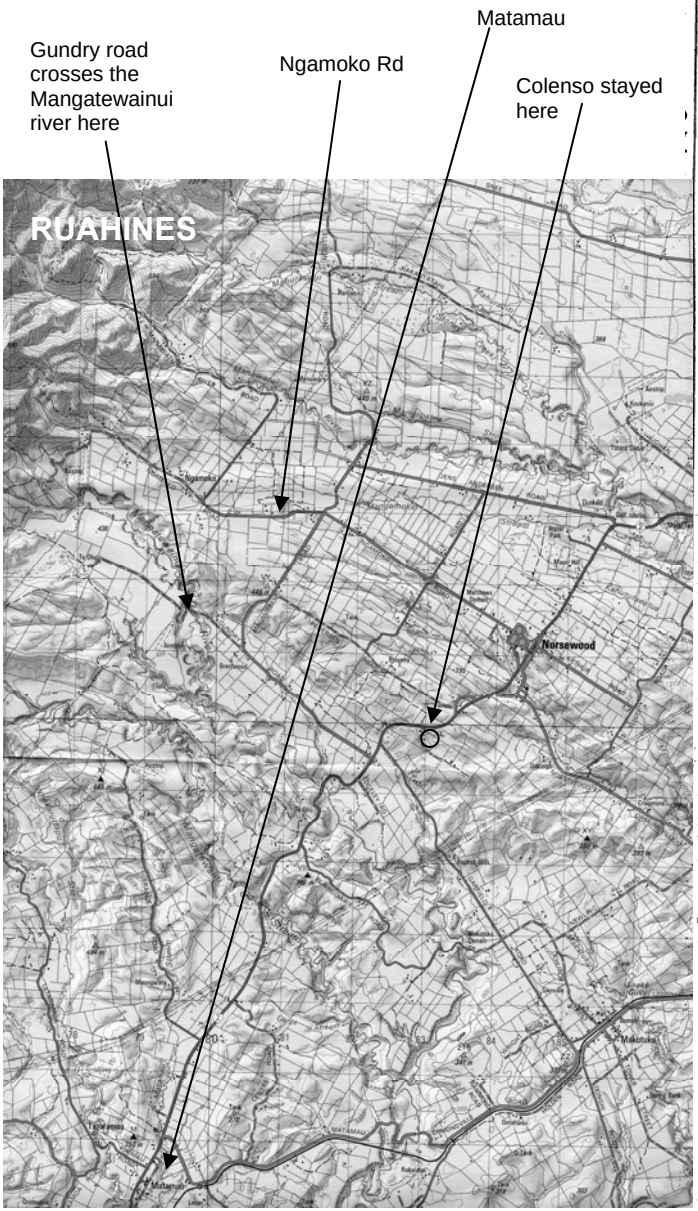
Stems stout, 8–10 inches long, sometimes branched at or near base. Leaves alternate, sessile, sub-linear-acuminate, acute, broadest near base, thickish, rather harsh and sub-rigid; petioles long, clasping, decurrent, extending to within the petiole below, black margined. Flowers terminal in compound panicles, 2–4 inches long, rather close-set, sub-distichous, each sub-panicle usually containing three flowers; bracts numerous, imbricated, striate, brown, the lower acuminate and fimbriate, the upper obtuse with a small mucro. Perianth pure white, 5–6 lines diameter, segments of equal length, spreading, recurved, obscurely 3-nerved, very obtuse; sepals ovate-oblong, margins entire; petals broadly obovate, crenulately notched on the middle of the upper margin; tip broadly oblong (or sub-5-sided), entire, obtuse or slightly retuse at apex, margins corrugated and incurved, two small ochraceous-yellow spots near the centre of tip, and two small greenish crescent-shaped calli beyond those spots and near the base. Column sub-hooded, tip ochraceous-yellow (exactly same hue as the two spots); appendages overhanging in front below anther, and produced in 4 small obtuse teeth and a minute tubercular wing on each side, with 2 minute mammillary-like dots in front, immediately below stigma. Ovary long, cylindrical, striate, twisted.

Hab. On edges of rocky cliffs and on dry stony declivities, and about the dry exposed roots of *Fagus solandri*; banks of River Manga-tawhainui, Seventy-mile Bush, County of Waipawa; 1878–85: *W.C*.

Obs. This plant in appearance closely resembles *E. autumnalis*, Hook. fil., of which it may (by some botanists) be considered as a variety. It possesses, however, sundry characters which that species has not, or which, at all events, are not given in any published description of it that I have seen. Indeed, Hook. fil., says of the genus, "disk eglandular;" whereas the disk of this species possesses two crescent-shaped greenish calli. *E. autumnalis*, which is so very common in the woods at the N., is a larger and fresher-looking plant, with flowers "speckled and sweet-scented," and is always epiphytical. Can difference of situation bring about change in characters as well as in habit? This plant is very plentiful in the locality named, causing those dry woods and stony cliffs to look lovely in the autumn season. It has given me a deal of repeated trouble and research, extending over several years, as for a long time I only took it to be a variety of *E. autumnalis*.

The Type specimen is in WELT.

Around Norsewood today



The Seventy Mile Bush

I discussed the Bush in relation to Colenso's finding *Microtis longifolia* in J108 p14. As school inspector, Colenso had visited the new towns and villages of the Bush in 1874, Norsewood and Dannevirke having been cleared by the Scandinavian settlers two years earlier. In the refound youth of his early seventies, he travelled by train from Napier and made daylong excursions from "headquarters in village hotels". [3].

Colenso also stayed with friends a kilometre or so west of Norsewood in a house called Fernhill [J109: p17]. In 1878-85 he would have taken Gundry Road WNW toward the Ruahines, crossing the Mangatawhainui 4km from Fernhill. Or the main road (now SH2) which crosses the river a few hundred metres from Fernhill, on his way to Matamau, a favourite haunt.

(Both Colenso and Bruce Hamlin have pointed out to the authorities that "Mangatawhainui" [hill of the big beeches] is the correct name, and that "Mangatewainui" makes little sense, but the authorities seem obdurate)

Coal was discovered, and a shaft was driven horizontally in the bank of the Mangatawhainui river, but the coal was of poor quality, and the mining project was abandoned. During the 1908 bush fire the coal caught fire and burned for two years. [4]

What's up the Mangatawhainui now?

The river is deep and gorged where Gundry Road crosses, and this, I thought, is probably Colenso's site. Indeed, 200m upstream from the crossing, an old *Earina* grows, its 100cm stems pendant from near the top of the 4m banks, under beech. It was in bud when we found it on 23 February: it had to be *Earina alba* Col.

We had to wait for its flowering, and when I returned on 12 April it was in full bloom—its perfumed flowers completely indistinguishable from *Earina autumnalis*, with its orange crescentic calli at the base of the labellum (**Inside Front Cover**).

Earina autumnalis up the Mangatawhainui

The river is gorged where SH2 crosses, and there are big old beeches there too. I searched for some time there for *Earina.* I found big lumps of brown coal in the stream, but no *Earina* on its banks.

Conclusion

Lindley was wrong – *E. autumnalis* was not a synonym for *E. mucronata*. And Hooker was wrong – the flowers of *E. autumnalis* are not speckled (where did he get that from? Perhaps Colenso's specimen No. 1607, "Earina rupestris, W.C., dry rocks, base of range, banks of R. Makaroro; labellum curiously dotted, &c"). And Colenso was wrong – Hooker may have written that the disk of *Earina* is eglandular – but he had noticed the lumps at the base, and had actually written of the genus, "*Labellum… basi sub-2-tuberculatum, disco nudo*"; ie, two tubercles at the base, disk nude.

The banks of the Mangatawhainui above Gundry Road, where *Earina autumnalis* grows

E. alba Col. was probably just an "alba" form of *E. autumnalis* Hook.f., simply lacking its red pigment. "Alba" forms are said to be common for many species, but I have never seen an alba form of *Earina autumnalis:* has anybody else?

Old beeches and steep banks below the SH2 bridge over the Mangatawhainui: no *Earina* there now

References

1. Colenso W. Trans. NZ Inst. 1886; 18: 267.
2. Cheeseman TF. *Manual of the New Zealand Flora.* 1st edition. Wellington, Government Printer, 1906.
3. Bagnall AG, Petersen GC. William Colenso….Reed, Wellington, 1948. p423
4. Andersen AL, Etheridge DC. *Norsewood – the Centennial story.* AL Andersen, 1972.

The NZ orchids

The publication last December of Dawson, Molloy and Beuzenberg's paper on the chromosomes of the NZ orchids has made our hitherto conservative approach to the new orchid taxonomy no longer tenable.

Murray Dawson has rejigged their paper for publication in our Journal, and the second part is published in this issue.

Their studies gave, for example, more support to splitting *Caladenia* and *Pterostylis* into new genera (changes we had instinctively not liked), than to splitting *Adelopetalum* and *Ichthyostomum* from *Bulbophyllum* (changes we had already accepted).

It is therefore logical now to accept most of the changes proposed by Mark Clements, David Jones, Brian Molloy and others over the last few years, and to that end the annual list has been updated, and the nomenclature in the *Journal* will follow suit.

Acianthus R.Br. Prodr. Fl. Nov. Holland.: 321 (1810). Acianthus alliance

Acianthus sinclairii Hook.f. Fl. Nov.-Zel. 1: 245 (1853).
Acianthus fornicatus var. sinclairii (Hook.f.) Hatch. Trans. & Proc. Roy. Soc. New Zealand 75: 369 (1945).

Adelopetalum Fitzg. J. Bot. 29: 152 (1891). Bulbophyllum alliance

Adelopetalum tuberculatum (Colenso) D.L.Jones, M.A.Clem. & Molloy. Orchadian 13(11): 498 (2002).
Bolbophyllum tuberculatum Colenso. Trans. & Proc. New Zealand Inst. 16: 336 (1884).
Bulbophyllum exiguum as meant by Buchanan. Trans. & Proc. New Zealand Inst. 16: 397 (1884), is not that of F.Muell. (1861).

Adenochilus Hook.f. Fl Nov.-Zel. 1: 246, t.56 (1853)

Adenochilus gracilis Hook.f. Fl. Nov.-Zel. 1: 246, t.56 (1853).

Anzybas D.L.Jones & M.A.Clem. Orchadian 13(10): 442 (2002). Corybas alliance

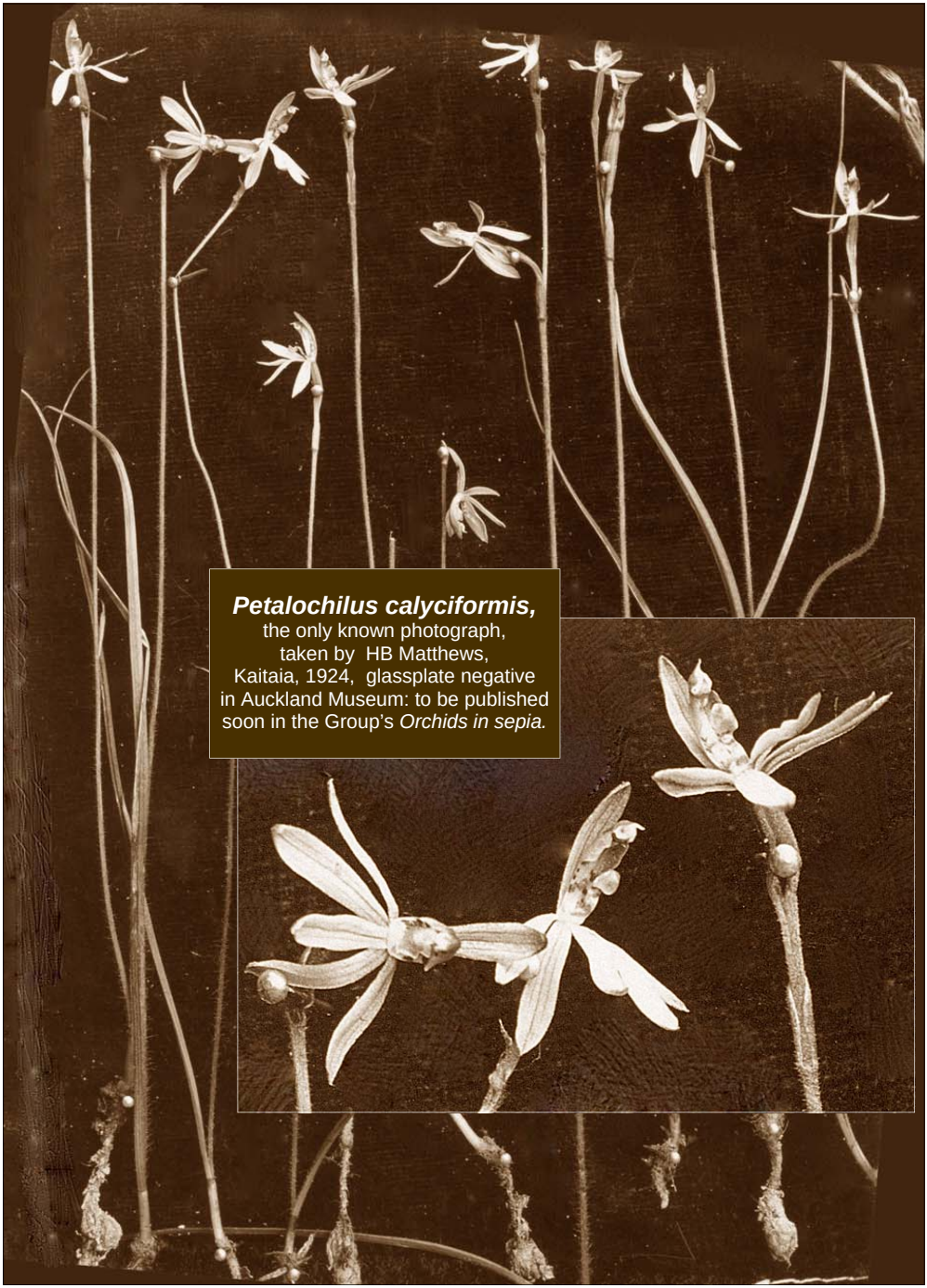
Anzybas carsei (Cheeseman) D.L.Jones & M.A.Clem. Orchadian 13(10): 443 (2002).
Corysanthes carsei Cheeseman. Trans. & Proc. New Zealand Inst. 44: 162 (1912).
Corybas carsei (Cheeseman) Hatch. Trans. & Proc. Roy. Soc. New Zealand 75: 367 (1945).
Corybas unguiculatus as meant by L.B.Moore. Fl. New Zealand Vol. 2: 116 (1970) is not Corysanthes unguiculatus of R.Br. (1810).

Anzybas rotundifolius (Cheeseman) D.L.Jones & M.A.Clem. Orchadian 13(10): 443 (2002).
Nematoceras rotundifolia Hook.f. Fl. Nov.-Zel. 1: 251 (1853).
Corysanthes rotundifolia (Hook.f.) Hook.f. Handb. N. Zeal. Fl. 266 (1864).
Corybas rotundifolius (Hook.f.) Rchb.f. Beitr. Syst. Pflanzenk. 67 (1871).
Corysanthes matthewsii Cheeseman. Trans. & Proc. New Zealand Inst. 31: 351 (1899).
Corybas matthewsii (Cheeseman) Schltr. Repert. Spec. Nov. Regni Veg. 19: 23 (1923).
Corybas unguiculatus as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 75: 367 (1945), is not Corysanthes unguiculatus of R.Br. (1810).

Aporostylis Rupp & Hatch. Proc. Linn. Soc. New South Wales 70: 60 (1946)

Aporostylis bifolia (Hook.f.) Rupp & Hatch. Proc. Linn. Soc. New South Wales 70: 60 (1946).
Caladenia bifolia Hook.f. Fl. Nov.-Zel. 1: 247 (1853).
Chiloglottis traversii F.Muell. Veg. Chath. Is. 51 (1864).
Caladenia macrophylla Colenso. Trans. & Proc. New Zealand Inst. 27: 396 (1895).
Chiloglottis bifolia (Hook.f.) Schltr. Engl. Bot. Jahrb. 45: 383 (1911).

A high-resolution image from RD FitzGerald's *Australian orchids* downloaded from http://orchid.unibas.ch, the "Swiss Orchid Foundation at the Herbarium Jany Renz".



Petalochilus calyciformis,
the only known photograph,
taken by HB Matthews,
Kaitaia, 1924, glassplate negative
in Auckland Museum: to be published
soon in the Group's *Orchids in sepia.*

Calochilus R.Br. Prodr. Fl. Nov. Holland.: 320 (1810)

Calochilus herbaceus Lindl. Gen. & Spec. Orch. Plant.: 45 (1840).
Calochilus campestris as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 77: 248 (1949), is not that of R.Br. (1810).

Calochilus paludosus R.Br. Prodr. Fl. Nov. Holland.: 320 (1810).

Calochilus robertsonii Benth. Fl. Austral. 6: 315 (1873).
Calochilus campestris as meant by Fitzg. Austral. Orchids 1(4): t.6 (1878), is not that of R.Br. (1810).
Calochilus campestris as meant by Cheeseman. Man. New Zealand Fl. 686 (1906), is not that of R.Br. (1810).

Corunastylis Fitzg. Austral. Orchids 2(3): t.1 (1888). Prasophyllum alliance

Corunastylis nuda (Hook.f.) D.L.Jones & M.A.Clem. Orchadian 13(10): 461 (2002).
Prasophyllum nudum Hook.f. Fl. Nov.-Zel. 1: 242 (1853).
Prasophyllum tunicatum Hook.f. Fl. Nov.-Zel. 1: 242 (1853).
Prasophyllum variegatum Colenso. Trans. & Proc. New Zealand Inst. 20: 208 (1888).
Genoplesium nudum (Hook.f.) D.L.Jones & M.A.Clem. Lindleyana 4(3): 144 (1989).

Corunastylis pumila (Hook.f.) D.L.Jones & M.A.Clem. Orchadian 13(10): 461 (2002).
Prasophyllum pumilum Hook.f. Fl. Nov.-Zel. 1: 242 (1853).
Genoplesium pumilum (Hook.f.) D.L.Jones & M.A.Clem. Lindleyana 4(3): 144 (1989).

Corybas Salisb. Parad. Lond. t.83 (1805). Corybas alliance

Corybas cheesemanii (Hook.f. ex Kirk) Kuntze. Revis. Gen. Pl. 2: 657 (1891).
Corysanthes cheesemanii Hook.f. ex Kirk. Trans. & Proc. New Zealand Inst. 3: 180 (1871).
Corybas aconitiflorus as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 75: 367 (1945), is not that of Salisb. (1807).

Cryptostylis R.Br. Prodr. Fl. Nov. Holland.: 317 (1810)

Cryptostylis subulata (Labill.) Rchb.f. Beitr. Syst. Pflanzenk. 15 (1871).
Malaxis subulata Labill. Nov. Holl. Pl. 2: 62, t.212 (1806).

Cyrtostylis R.Br. Prodr. Fl. Nov. Holland.: 322 (1810). Acianthus alliance

Cyrtostylis oblonga Hook.f. Fl. Nov.-Zel. 1: 246 (1853).
Acianthus reniformis var. oblonga (Hook.f.) Rupp & Hatch. Proc. Linn. Soc. New South Wales 70: 59 (1946).

Cyrtostylis rotundifolia Hook.f. Fl. Nov.-Zel. 1: 246 (1853).
Cyrtostylis macrophylla Hook.f. Fl. Nov.-Zel. 1: 246 (1853).
Caladenia reniformis (R.Br.) Rchb.f. Beitr. Syst. Pflanzenk. 67 (1871).
Cyrtostylis oblonga (Hook.f.) var. rotundifolia (Hook.f.) Cheeseman. Man. New Zealand Fl. 685 (1906).
Acianthus reniformis (R.Br.) Schltr. Engl. Bot. Jahrb. 34: 39 (1906).
Acianthus reniformis var. reniformis (Hook.f.) Rupp & Hatch. Proc. Linn. Soc. New South Wales 70: 59 (1946).
Cyrtostylis reniformis as used by many authors until now is not that of R.Br. Prodr. Fl. Nov. Holland.: 322 (1810).

Danhatchia Garay & Christenson. Orchadian 11(10): 469, f.471 (1995)

Danhatchia australis (Hatch) Garay & Christenson. Orchadian 11(10): 470 (1995).
Yoania australis Hatch. Trans. Roy. Soc. New Zealand, Bot. 2: 185 (1963).

Diplodium D.L.Jones, Molloy & M.A.Clem. Austral. Orchid Res. 4: 70 (2002). Pterostylis alliance

Diplodium alobulum (Hatch) D.L.Jones, Molloy & M.A.Clem. Austral. Orchid Res. 4: 70 (2002).
Pterostylis trullifolia as meant by Cheeseman. Man. New Zealand Fl. (1906), is not that of Hook.f.
Pterostylis trullifolia Hook.f. var. alobula Hatch. Trans. Roy. Soc. NZ 77: 244, t.30, f.3E–H (1949).
Pterostylis alobula (Hatch) L.B.Moore. New Zealand J. Bot. 6: 486, f.3 (1969).

Diplodium alveatum (Garnet) D.L.Jones & M.A.Clem. Austral. Orchid Res. 4: 70 (2002).
Pterostylis alveata Garnet. Victoria Naturalist 59: 91 (1939).

Diplodium brumale (L.B.Moore) D.L.Jones, Molloy & M.A.Clem. Austral. Orchid Res. 4: 70 (2002).
Pterostylis trullifolia Hook.f. var. rubella Hatch. Trans. & Proc. Roy. Soc. New Zealand 77: 244 (1949).
Pterostylis brumalis L.B.Moore. New Zealand J. Bot. 6: 485, f.3 (1969).
Diplodium trullifolium (Hook.f.) D.L.Jones, Molloy & M.A.Clem. Austral. Orchid Res. 4: 72 (2002).
Pterostylis trullifolia Hook.f. Fl. Nov.-Zel. 1: 249 (1853).
Pterostylis rubella Colenso. Trans. & Proc. New Zealand Inst. 18: 271 (1886).
Pterostylis trullifolia Hook.f. var. gracilis Cheeseman. Trans. & Proc. New Zealand Inst. 47: 271 (1915).

Drymoanthus Nicholls. Victorian Naturalist 59: 173 (1943)

Drymoanthus adversus (Hook.f.) Dockrill. Australasian Sarcanthinae: 32, t.3 (1967).
Sarcochilus adversus Hook.f. Fl. Nov.-Zel. 1: 241 (1853).
Sarcochilus breviscapa Colenso. Trans. & Proc. New Zealand Inst. 14: 332 (1882).
Drymoanthus flavus St George & Molloy. New Zealand J. Bot. 32: 416, f.1 (1994).

Earina Lindl. Bot. Reg. sub t.1699 (1834)

Earina aestivalis Cheeseman. Trans. & Proc. New Zealand Inst. 51: 93 (1919).
Earina autumnalis (G.Forst.) Hook.f. Fl. Nov.-Zel. 1: 239 (1853).
Epidendrum autumnale G.Forst. Prodr. 60 (1786).
Earina suaveolens Lindl. Bot. Reg. 29 (1843).
Earina alba Colenso. Trans. & Proc. New Zealand Inst. 18: 267 (1886).
Earina mucronata Lindl. Bot. Reg. 20 sub t.1699 (1834).
Earina quadrilobata Colenso. Trans. & Proc. New Zealand Inst. 15: 325 (1883).

Gastrodia R.Br. Prodr. Fl. Nov. Holland.: 330 (1810)

Gastrodia cunninghamii Hook.f. Fl. Nov.-Zel. 1: 251 (1853).
Gastrodia leucopetala Colenso. Trans. & Proc. New Zealand Inst. 18: 268 (1886).
Gastrodia minor Petrie. Trans. & Proc. New Zealand Inst. 25: 273, t.20, f.5–7 (1893).
Gastrodia "long column" agg.: there are a number of late flowering Gastrodia with a long column.
Gastrodia aff. sesamoides. Gastrodia sesamoides as meant by Cheeseman. Man. New Zealand Fl. 697 (1906), is not that of R.Br. (1810).
Gastrodia "city" appears to be a variant.

Hymenochilus D.L.Jones, M.A.Clem. & Molloy. Austral. Orchid Res. 4: 72 (2002). Pterostylis alliance

Hymenochilus tanypodus (D.L.Jones, Molloy & M.A.Clem.) D.L.Jones, M.A.Clem. & Molloy. Austral. Orchid Res. 4: 74 (2002).
Pterostylis tanypoda D.L.Jones, Molloy & M.A.Clem. Orchadian 12(6): 273 (1997).
Pterostylis cycnocephala as meant by L.B.Moore. Fl. New Zealand Vol. 2: 135 (1970) and others (1970–1997), is not that of Fitzg. (1876).
Hymenochilus tristis (Colenso) D.L.Jones, M.A.Clem. & Molloy. Austral. Orchid Res. 4: 74 (2002).
Pterostylis tristis Colenso. Trans. & Proc. New Zealand Inst. 18: 271 (1886).
Pterostylis mutica as meant by Cheeseman. Trans. & Proc. New Zealand Inst. 15: 300 (1883), is not that of R.Br. (1810).

Ichthyostomum D.L.Jones, M.A.Clem. & Molloy. Orchadian 13(11): 499 (2002). Bulbophyllum alliance

Ichthyostomum pygmaeum (Sm.) D.L.Jones, M.A.Clem. & Molloy. Orchadian 13(11): 499 (2002).
Dendrobium pygmaeum Sm. in Rees. Cycl. (Rees) 11: n.27 (1808).
Bulbophyllum pygmaeum (Sm.) Lindl. Gen. Sp. Orchid. Pl. 58 (1830).
Bolbophyllum ichthyostomum Colenso. Trans. & Proc. New Zealand Inst. 26: 319 (1894).

Linguella D.L.Jones, M.A.Clem. & Molloy. Austral. Orchid Res. 4: 74 (2002). Pterostylis alliance

Linguella puberula (Hook.f.) D.L.Jones, M.A.Clem. & Molloy. Austral. Orchid Res. 4: 75 (2002).
Pterostylis puberula Hook.f. Fl. Nov.-Zel. 1: 249 (1853).
Pterostylis nana as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 77: 237 (1949), is not that of R.Br. (1810).
Pterostylis aff. nana.

Microtis R.Br. Prodr. Fl. Nov. Holland.: 320 (1810). Prasophyllum alliance

Microtis arenaria Lindl. Gen. Sp. Orchid. Pl. t.306 (1840).
Microtis biloba Nicholls. Victoria Naturalist 66: 93, f.O–L (1949).

Microtis oligantha L.B.Moore. New Zealand J. Bot. 6: 473, f.1 (1969).
Microtis magnadenia as meant by Hatch. Trans. Roy. Soc. New Zealand, Bot. 2: 185–189 (1963), is not that of R.S.Rogers (1930).

Microtis parviflora R.Br. Prodr. Fl. Nov. Holland.: 321 (1810).
Microtis javanica Rchb.f. Bonplandia 5: 36 (1857).
Microtis benthamiana Rchb.f. Beitr. Syst. Pflanzenk. 24 (1871).
Microtis longifolia Col. Trans. & Proc. New Zealand Inst. 17: 247 (1885).
Microtis porrifolia (Sw.) R.Br. ex Spreng. var. parviflora (R.Br.) Rodway. Tasman. Fl. 159 (1903).
Microtis aemula Schltr. Bot. Jahrb. Syst. 39: 37 (1906).
Microtis bipulvinaris Nicholls. Victoria Naturalist 66: 92–94, f.A–F (1949).
Microtis holmesii Nicholls. Victoria Naturalist 66: 93, f.G–I (1949).

Microtis unifolia (G.Forst.) Rchb.f. Beitr. Syst. Pflanzenk. 62 (1871).
Ophrys unifolia G.Forst. Fl. Ins. Austr. 59 (1786).
Epipactis porrifolia Sw. Kongl. Vetensk. Acad. Nya Handl. 21: 233 (1800).
Microtis porrifolia (Sw.) R.Br. ex Spreng. Syst. Veg. (ed. 16) [Sprengel] 3: 713 (1826).
Microtis banksii A.Cunn. Bot. Mag. 62: sub 1.3377 (1835).
Microtis frutetorum Schltdl. Linnaea 20: 568 (1847).
Microtis viridis F.Muell. Fragm. (Mueller) 5: 97 (1866).
Microtis longifolia Colenso. Trans. & Proc. New Zealand Inst. 17: 247 (1885). This is a late flowering form.
Microtis papillosa Colenso. Trans. & Proc. New Zealand Inst. 18: 269 (1886).
Microtis pulchella as meant by Lindl. Gen. Sp. Orchid. Pl. 395 (1840), is not that of R.Br. (1810).

Microtis aff. unifolia: a late flowering form allied to M. unifolia and M. parviflora.

Molloybas D.L.Jones & M.A.Clem. Orchadian 13(10): 448 (2002). Corybas alliance

Molloybas cryptanthus (Hatch) D.L.Jones & M.A.Clem. Orchadian 13(10): 448 (2002).
Corybas cryptanthus Hatch. Trans. Roy. Soc. New Zealand 83: 577 (1956).
Corybas saprophyticus as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 79: 366, t.71 (1952), is not that of Schltr. (1923).

Myrmechila D.L.Jones & M.A.Clem. Orchadian 15(1): 36–37 (2005). Chiloglottis alliance

Myrmechila formicifera (Fitzg.) D.L.Jones & M.A.Clem. Orchadian 15(1): 37 (2005).
Chiloglottis formicifera Fitzg. Austral. Orchids 1(3): (1877).

Myrmechila trapeziformis (Fitzg.) D.L.Jones & M.A.Clem. Orchadian 15(1): 37 (2005).
Chiloglottis trapeziformis Fitzg. Austral. Orchids 1(3): (1877).

Nematoceras Hook.f. Fl. N. Zel . 1: 249, t.57 (1853). Corybas alliance

Nematoceras acuminatum (M.A.Clem. & Hatch) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Corybas acuminatus M.A.Clem. & Hatch. New Zealand J. Bot. 23: 491, f.2 (1985).
Corysanthes acuminata (M.A.Clem. & Hatch) Szlach. Richardiana 3(2): 97 (2003).
Corybas rivularis as meant by Cheeseman. Man. New Zealand Fl. 697 (1906), and others (1906–1985), is not Acianthus rivularis of A.Cunn. (1837).

Nematoceras hypogaeum (Colenso) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Corysanthes hypogaea Colenso. Trans. & Proc. New Zealand Inst. 16: 336 (1884).

Nematoceras iridescens (Irwin & Molloy) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Corybas iridescens Irwin & Molloy. New Zealand J. Bot. 34: 1, f.1 (1996).
Corysanthes iridescens (Irwin & Molloy) Szlach. Richardiana 3(2): 98 (2003).
Corybas "A" tagname.

Nematoceras longipetalum (Hatch) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Corybas macranthus (Hook.f.) Rchb.f. var. longipetalus Hatch. Trans. & Proc. Roy. Soc. New Zealand 76: 580, t.60(1) (1947).
Corybas longipetalus (Hatch) Hatch. NZNOG Journal 47: 6 (1993), is not that of Schltr. (1923).
Corybas orbiculatus (Colenso) L.B.Moore. Fl. New Zealand Vol. 2: 118 (1970), is not Corysanthes orbiculata of Colenso (1891).

Nematoceras macranthum Hook.f. Fl. Nov.-Zel. 1: 250 (1853).
Corysanthes macrantha (Hook.f.) Hook.f. Handb. N. Zeal. Fl. 266 (1864).
Corybas macranthus (Hook.f.) Rchb.f. Beitr. Syst. Pflanzenk. 67 (1871).
There are several entities in this aggregate. Probable hybrids with insect-pollinated members of the N. trilobum aggregate have been reported.

Nematoceras orbiculatum (Colenso) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Corysanthes orbiculata Colenso. Trans. & Proc. New Zealand Inst. 23: 389 (1891).
Corybas orbiculatus as meant by L.B.Moore. Fl. New Zealand Vol. 2: 118 (1970) and others (1970–1996), is not Corysanthes orbiculatus of Colenso (1891) (see Molloy & Irwin. New Zealand J. Bot. 34 (1): 5 [1996]).
Corybas "short tepals" and Corybas "C" tagnames.

Nematoceras panduratum (Cheeseman) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Corysanthes rotundifolia var. pandurata Cheeseman. Man. New Zealand Fl. 366 (1925), is not Nematoceras rotundifolia of Hook.f.
This has been regarded as a synonym of Nematoceras rivulare, but its status remains speculative.

Nematoceras papa (Molloy & Irwin) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Corybas papa Molloy & Irwin. New Zealand J. Bot. 34(1): 5, f.1 (1996).
Corysanthes papa (Molloy & Irwin) Szlach. Richardiana 3(2): 98 (2003).
Corybas "Mt Messenger" and Corybas "B" tagnames.

Nematoceras papillosum (Colenso) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Corysanthes papillosa Colenso. Trans. & Proc. New Zealand Inst. 16: 337 (1884).
This has been regarded as a form of Nematoceras macranthum, and though its status remains speculative, the form with a white lower labellum has been identified with this name.

Nematoceras rivulare (A.Cunn.) Hook.f. Fl. Nov.-Zel. 1: 251 (1853).
Acianthus rivularis A.Cunn. Companion Bot. Mag. 2: 376 (1837).
Corysanthes rivularis (A.Cunn.) Hook.f. Handb. N. Zeal. Fl. 266 (1864).
Corybas rivularis (A.Cunn.) Rchb.f. Beitr. Syst. Pflanzenk. 67 (1871).
Corysanthes rotundifolia as meant by Cheeseman. Man. New Zealand Fl. 695 (1906), is not Nematoceras rotundifolia of Hook.f. (1853).
Corybas orbiculatus as meant by L.B.Moore. Fl. New Zealand Vol. 2: 118 (1970) and others (1970–1996), is not Corysanthes orbiculatus of Colenso (1891).
Corybas "Kerikeri" tagname.
The Nematoceras rivulare complex includes unnamed taxa with the tagnames N. "Kaimai", N. "rest area", N. "Kaitarakihi", N. "whiskers" (aka N. "viridis"), N. "Mangahuia", N. "sphagnum", N. "veil", N. "Pollok" and N. "Motutangi".

Nematoceras trilobum Hook.f. Fl. Nov.-Zel. 1: 250 (1853).
Corysanthes triloba (Hook.f.) Hook.f. Handb. N. Zeal. Fl. 265 (1864).
Corybas trilobus (Hook.f.) Rchb.f. Beitr. Syst. Pflanzenk. 67 (1871).
About 25 taxa in the Nematoceras trilobum complex are of speculative taxonomic status; they include the late-flowering N. "Trotters" (almost certainly N. trilobum sens. strict.), the tiny May to July flowering forms with the tagname N. "pygmy"; N. "Rimutaka" (NZNOG Journal 58: 8–9 [1996]), N. "round leaf", N. "craigielea", N. "darkie", N. "trisept", N. "triwhite", and many others. The N. trilobum complex has tetraploids in the South Island and Chatham I., and predominantly diploids in the North Island, but further chromosome counts are needed (see Dawson, Molloy & Beuzenberg. New Zealand J. Bot. 45(4): 644 [2007]).

Nematoceras aff. sulcatum: a form on the Chathams, similar to N. sulcatum from Macquarie Is (see Molloy BPJ. Orchids of the Chatham Islands. DOC [2002]).

Orthoceras R.Br. Prodr. Fl. Nov. Holland.: 316 (1810)

Orthoceras novae-zeelandiae (A.Rich.) M.A.Clem., D.L.Jones & Molloy. Austral. Orchid Res., 1: 100 (1989).

Diuris novae-zeelandiae A.Rich. Essai Fl. Nov. Zel. 163 t.25, f.1 (1832).
Orthoceras solandri Lindl. Gen. Sp. Orchid. Pl. 512 (1840).
Orthoceras rubrum Colenso. Trans. & Proc. New Zealand Inst. 18: 273 (1886).
Orthoceras caput-serpentis Colenso. Trans. & Proc. New Zealand Inst. 22: 490 (1890).
Orthoceras strictum R.Br. forma viride Hatch. Trans. Roy. Soc. N.Z. Bot.2; 195 (1963).

Orthoceras strictum R.Br. Prodr. Fl. Nov. Holland.: 317 (1810).

Petalochilus R.S.Rogers. J. Bot. 62: 65 (1924). Caladenia alliance

Petalochilus alatus (R.Br.) D.L.Jones & M.A.Clem. Orchadian 13(9): 406 (2001).
Caladenia alata R.Br. Prodr. Fl. Nov. Holland.: 324 (1810).
Caladenia minor Hook.f. var. exigua Cheeseman. Man. New Zealand Fl. 688 (1906).
Caladenia exigua Cheeseman. Trans. & Proc. New Zealand Inst. 45: 96 (1913).
Caladenia carnea R.Br. var. alata (R.Br.) Domin. Bibliotheca Botanica Heft 85: 549 (1915).
Caladenia carnea R.Br. var. exigua (Cheeseman) Rupp. Proc. Linn. Soc. New South Wales 69: 75 (1944).
Caladenia holmesii Rupp. Victoria Naturalist 70: 179 (1954).
Caladenia catenata (Sm.) Druce var. exigua (Cheeseman) W.M.Curtis. Stud. Fl. Tasman., 4A: 133 (1979).

Petalochilus bartlettii (Hatch) D.L.Jones & M.A.Clem. Orchadian 13(9): 406 (2001).
Caladenia carnea R.Br. var. bartlettii Hatch. Trans. & Proc. Roy. Soc. New Zealand 77: 402 (1949).
Caladenia bartlettii (Hatch) D.L.Jones, Molloy & M.A.Clem. Orchadian 12(5): 227 (1997).

Petalochilus calyciformis R.S.Rogers. J. Bot. 62: 66 (1924).
Moore (1970) treated this as an aberrant floral (peloric) mutation of other species.

Petalochilus chlorostylus (D.L.Jones, Molloy & M.A.Clem.) D.L.Jones & M.A.Clem. Orchadian 13(9): 406 (2001).
Caladenia catenata as meant by Cooper. Field guide to the NZ native orchids 17 (1984), is not that of Druce (1917).
Caladenia chlorostyla D.L.Jones, Molloy & M.A.Clem. Orchadian 12(5): 223 f1 (1997).
Caladenia "green column" tagname.
Arethusa catenata and Caladenia alba are names used for Australian plants once confused with NZ taxa.

Petalochilus aff. chlorostylus is a similar taxon to Petalochilus chlorostylus, with red hairs and later flowering.

Petalochilus minor (Hook.f.) D.L.Jones & M.A.Clem. Orchadian 13(9): 410 (2001).
Caladenia minor Hook.f. Fl. Nov.-Zel. 1: 247, t.56b (1853).
Caladenia carnea var. pygmaea (R.S.Rogers) Rupp. Proc. Linn. Soc. New South Wales 69: 74 (1944).
Caladenia carnea R.Br. var. minor (Hook.f.) Hatch. Trans. & Proc. Roy. Soc. New Zealand 77: 401 (1949).
Caladenia catenata var. minor (Hook.f.) W.M.Curtis. Stud. Fl. Tasman., 4A: 106 (1979).
The identity of Petalochilus minor is not clear, but it may be the taxon known as P. aff. chlorostylus.

Petalochilus nothofageti (D.L.Jones, Molloy & M.A.Clem.) Jones & M.A.Clem. Orchadian 13(9): 410 (2001).
Caladenia nothofageti D.L.Jones, Molloy & M.A.Clem. Orchadian 12(5): 226, f.1 (1997).

Petalochilus saccatus R.S.Rogers. J. Bot. 62: 66, t.571, 4–7 (1924).
Caladenia saccata (R.S.Rogers) Hopper & A.P.Br. Austral. Syst. Bot. 17: 171–240 (2004).
Moore (1970) treated this as an aberrant floral (peloric) mutation of other species.

Petalochilus variegatus (Colenso) D.L.Jones & M.A.Clem. Orchadian 13(9): 410 (2001).
Caladenia variegata Colenso. Trans. & Proc. New Zealand Inst. 17: 248 (1885).
Caladenia "big pink" tagname. Some flowers have a clear two rows of calli on the labellum, others have extra calli scattered to either side of the two rows.

Petalochilus aff. fuscatus: a small pink flowered entity which appears similar to the variable Australian species Petalochilus fuscatus. See Scanlen. NZNOG Journal 72: 22 [1999]). It appears to be identical with HB Matthews's Caladenia "nitida-rosea" (see Scanlen E. Matthews & son on orchids. NZNOG Historical Series 2006; 14: 12).

Petalochilus aff. pusillus: a tiny pink flowered entity with broad oval sepals and petals, an incurved dorsal sepal and a triangular labellar midlobe; grows near Wellington, Taranaki and in Northland (W.M.Curtis. Stud. Fl. Tasman., 4A: 133 [1980]).

Plumatichilos Szlach. Polish Bot. J. 46(1): 23 (2001). Pterostylis alliance

Plumatichilos tasmanicum (D.L.Jones) Szlach. Polish Bot. J. 46(1): 23 (2001).
Pterostylis tasmanica D.L.Jones. Muelleria 8(2): 177 (1994).
Pterostylis squamata as meant by Hook.f. Fl. Nov.-Zel. 1: 249 (1853), is not that of R.Br. (1810).
Pterostylis barbata as meant by Cheeseman. Man. New Zealand Fl. 683 (1906), is not that of Lindl. (1840).
Pterostylis plumosa as meant by Cooper. Field guide to NZ native orchids 51 (1981), is not that of Cady (1969).
Jones suggests there is a second unnamed NZ entity.

Prasophyllum R.Br. Prodr. Fl. Nov. Holland.: 317 (1810)

Prasophyllum colensoi Hook.f. Fl. Nov.-Zel. 1: 241 (1853).
Prasophyllum pauciflorum Colenso. Trans. & Proc. New Zealand Inst. 18: 273 (1886).
Prasophyllum rogersii as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 76: 290 (1946), is not that of R.S.Rogers & Rees (1921).
Probably a number of taxa, possibly including Irwin's P. "A" and P. "B" (NZNOG Journal 79: 9–10 [2001]).
Prasophyllum hectorii (Buchanan) Molloy, D.L.Jones & M.A.Clem. Orchadian 15: 41 (2005).
Gastrodia hectori Buchanan. Trans. & Proc. New Zealand Inst. 19: 214 (1886).
Prasophyllum patens as meant by Cheeseman. Man. New Zealand Fl. (1906), is not that of R.Br. (1810).
Prasophyllum suttoni as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 76: 291 (1946), is not that of Rupp (1928).

Pterostylis R.Br. Prodr. Fl. Nov. Holland.: 326 (1810). Pterostylis alliance

Pterostylis agathicola D.L.Jones, Molloy & M.A.Clem. Orchadian 12(6): 266 (1997).
Pterostylis graminea (Hook.f.) var. rubricaulis H.B.Matthews ex Cheeseman. Man. New Zealand Fl. 351 (1925).
Pterostylis montana (Hatch) var. rubricaulis (Cheeseman) Hatch. Trans. & Proc. Roy. Soc. New Zealand 77: 240, plate 23 (1949).
Pterostylis "rubricaulis" tagname.
Pterostylis areolata Petrie. Trans. & Proc. New Zealand Inst. 50: 210 (1918).
Pterostylis auriculata Colenso. Trans. & Proc. New Zealand Inst. 22: 489 (1890).
Pterostylis "Catlins" tagname.
Pterostylis australis Hook.f. Fl. Nov.-Zel. 1: 248 (1853).
Pterostylis banksii A.Cunn. Companion Bot. Mag. 2: 376 (1837).
Pterostylis emarginata Colenso. Trans. & Proc. New Zealand Inst. 15: 328 (1883).
Pterostylis speciosa Colenso. Trans. & Proc. New Zealand Inst. 22: 488 (1890).
Pterostylis subsimilis Colenso. Trans. & Proc. New Zealand Inst. 28: 611 (1896).
Pterostylis aff. banksii: A smaller taxon than true P. banksii, common around Wellington, and apparently found elsewhere (see NZNOG Journal 80: 14,19 [2001]).
Pterostylis cardiostigma D.Cooper. New Zealand J. Bot. 21: 97, f.1,2 (1983).
Pterostylis cernua D.L.Jones, Molloy & M.A.Clem. Orchadian 12(6): 267, f.2 (1997).
Pterostylis foliata Hook.f. Fl. Nov.-Zel. 1: 249 (1853).
Pterostylis vereenae R.S.Rogers. Trans. & Proc. Roy. Soc. South Australia 38: 360–361, f.18(2) (1914).
Pterostylis gracilis Nicholls. Victoria Naturalist 43: 324–326 (1927).
Pterostylis graminea Hook.f. Fl. Nov.-Zel. 1: 248 (1853).
There are several taxa in the P. graminea complex, including tagname P. "sphagnum".
Pterostylis humilis R.S.Rogers. Trans. & Proc. Roy. Soc. South Australia 46: 151 (1922).
Pterostylis irsoniana Hatch. Trans. & Proc. Roy. Soc. New Zealand 78: 104, t.18 (1950).
Pterostylis irwinii D.L.Jones, Molloy & M.A.Clem. Orchadian 12(6): 269 (1997).
Pterostylis "Erua" tagname.
Pterostylis micromega Hook.f. Fl. Nov.-Zel. 1: 248 (1853).
Pterostylis polyphylla Colenso. Trans. & Proc. New Zealand Inst. 22: 489 (1890).
Pterostylis furcata Lindl. var. micromega Hatch. Trans. Roy. Soc. New Zealand 80: 326 (1953).
Pterostylis montana Hatch. Trans. & Proc. Roy. Soc. New Zealand 77: 239, t.22 (1949).
Pterostylis aff. montana agg.: includes as many as 14 undescribed taxa, including the distinctive P. "Blyth".
Pterostylis nutans R.Br. Prodr. Fl. Nov. Holland.: 327 (1810).
Pterostylis matthewsii Cheeseman. Trans. & Proc. New Zealand Inst. 47: 46 (1915).
Pterostylis oliveri Petrie. Trans. & Proc. New Zealand Inst. 26: 270 (1894).
Pterostylis paludosa D.L.Jones, Molloy & M.A.Clem. Orchadian 12(6): 271 (1997).
Pterostylis furcata Lindl. var. linearis Hatch. Trans. & Proc. Roy. Soc. NZ 77: 243, plate 29, 2 (1949).
Pterostylis "linearis" tagname.
Pterostylis patens Colenso. Trans. & Proc. New Zealand Inst. 18: 270 (1886).
Pterostylis banksii Hook.f. var. patens (Colenso) Hatch. Trans. & Proc. Roy. Soc. New Zealand 75: 370 (1945).

Pterostylis porrecta D.L.Jones, Molloy & M.A.Clem. Orchadian 12(6): 272 (1997).
Pterostylis aff. graminea.
P. "Hackett" tagname.
Pterostylis silvicultrix (F.Muell.) Molloy, D.L.Jones & M.A.Clem. Austral. Orchid Res. 4: 66 (2002).
Pterostylis banksii var. silvicultrix F.Muell. Veg. Chath. Is. 51 (1864).
Pterostylis venosa Colenso. Trans. & Proc. New Zealand Inst. 28: 610 (1896).
Pterostylis confertifolia Allan. Trans. & Proc. New Zealand Inst. 56: 32 (1926).
Pterostylis trifolia Colenso. Trans. & Proc. New Zealand Inst. 31: 281 (1899).

Simpliglottis Szlach. Polish Bot. J. 46(1): 13 (2001). Chiloglottis alliance

Simpliglottis cornuta (Hook.f.) Szlach. Polish Bot. J. 46(1): 13 (2001).
Chiloglottis cornuta Hook.f. Bot. Antarct. Voy., Vol. 1, Fl. Antarct.: 69 (1844).
Caladenia cornuta (Hook.f.) Rchb.f. Beitr. Syst. Pflanzenk. 67 (1871).
The NZ form of Simpliglottis cornuta may differ from the Australian, and may be an aggregate of taxa.
Simpliglottis valida (D.L.Jones) Szlach. Polish Bot. J. 46(1): 14 (2001).
Chiloglottis valida D.L.Jones. Austral. Orchid Res. 2: 43–44, t. 54, plate p.92 (1991).
Chiloglottis gunnii as meant by Molloy. Native orchids of NZ: 9 (1983), is not that of Lindl. (1840).

Singularybas Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002). Corybas alliance

Singularybas oblongus (Hook.f.) Molloy, D.L.Jones & M.A.Clem. Orchadian 13(10): 449 (2002).
Nematoceras oblonga Hook.f. Fl. Nov.-Zel. 1: 250, t.57B (1853).
Corysanthes oblonga (Hook.f.) Hook.f. Handb. N. Zeal. Fl. 266 (1864).
Corybas oblongus (Hook.f.) Rchb.f. Beitr. Syst. Pflanzenk. 67 (1871).
There are two or three taxa included in this complex. One appears to be identical with HB Matthews's Corysanthes "aestivalis" (see Scanlen E. Matthews & son on orchids. NZNOG Historical Series 2006; 14: 12). A white flowered form may also be separate.

Spiranthes Rich. De Orchid. Eur. 20, 28, 36 (1817)

Spiranthes novae-zelandiae Hook.f. Fl. Nov.-Zel. 1: 243 (1853).
Spiranthes australis as meant by Hook.f. Handb. N. Zeal. Fl. 272 (1864), is not that of Lindl. (1824).
Spiranthes sinensis as meant by Rupp & Hatch. Proc. Linn. Soc. New South Wales 70: 58 (1946), is not that of Ames (1908).
Spiranthes lancea as meant by Hatch. Trans. Roy. Soc. New Zealand 82: 614 (1954), is not that of Backer, Bakh.f. & Steenis (1950).
The name Neottia sinensis has been used for Spiranthes australis in Australia, as has the name Spiranthes sinensis var. australis (R.Br.) H.Hara & Kitam. Acta Phytotox. Geobot. 36 (1–3): 93 (1985).
Spiranthes "Motutangi": tagname for endangered Far North taxon similar to S. australis.

Stegostyla D.L.Jones & M.A.Clem. Orchadian 13(9): 411 (2001). Caladenia alliance

Stegostyla atradenia (D.L.Jones, Molloy & M.A.Clem.) D.L.Jones & M.A.Clem. Orchadian 13(9): 414 (2001).
Caladenia iridescens as meant by Hatch. NZNOG Newsletter 16: 1 (1985), is not that of R.S.Rogers (1920).
Caladenia carnea R.Br. var. minor forma calliniger Hatch. Trans. Roy. Soc. New Zealand, Bot. 2: 187 (1963).
Caladenia atradenia D.L.Jones, Molloy & M.A.Clem. Orchadian 12(5): 221 (1997).
"Caladenia calliniger" and Caladenia aff. iridescens tagnames.
Stegostyla lyallii (Hook.f.) D.L.Jones & M.A.Clem. Orchadian 13(9): 413 (2001).
Caladenia lyallii Hook.f. Fl. Nov.-Zel. 1: 247 (1853).
There seem to be a number of taxa currently included in the S. lyallii agg., including a small form from Iwitahi and Nelson Lakes.
Stegostyla aff. alpina: plants structurally closer to S. alpina than to S. lyallii are in NZ (see St George.

NZNOG Journal 63: 4 [1997]).

Sullivania F.Muell. J. Proc. Roy. Soc. New South Wales 15: 229 (1882).

Sullivania minor (R.Br.) D.L.Jones & M.A.Clem. Orchadian 15: 36 (2005).
Caleana minor R.Br. Prodr. Fl. Nov. Holland.: 329 (1810).
Caleya minor (R.Br.) Sweet. Hort. Brit. (Sweet) 385 (1827).
Caleya sullivanii F.Muell. Australas. Chem. Druggist 4: 44 (1882).
Caleana nublingii Nicholls. Victoria Naturalist 48: 15 (1931).
Paracaleana sullivanii (F.Muell.) Blaxell. Contr. New South Wales Natl. Herb. 4:281 (1972).
Paracaleana minor (R.Br.) Blaxell. Contr. New South Wales Natl. Herb. 4: 281 (1972).

Thelymitra J.R.Forst. & G.Forst. Char. Gen. Pl. 97 t.49 (1776)

Thelymitra aemula Cheeseman. Trans. & Proc. New Zealand Inst. 51: 94 (1919).
Thelymitra aff. brevifolia: a NZ form of T. pauciflora s.l. with an orange column similar to that of T. brevifolia Jeanes of Australia.
Thelymitra carnea R.Br. Prodr. Fl. Nov. Holland.: 314 (1810).
Thelymitra imberbis Hook.f. Fl. Nov.-Zel. 1: 244 (1853).
Thelymitra carnea R.Br. var. imberbis (Hook.f.) Rupp & Hatch. Proc. Linn. Soc. New South Wales 70: 59 (1946).
Thelymitra colensoi Hook.f. Handb. N. Zeal. Fl. 271 (1864)
Thelymitra intermedia Berggr. Minneskr. Fisiog. Sallsk. Lund 8: 21 f (1878).
Thelymitra longifolia J.R.Forst. & G.Forst. var. stenopetala Hatch. Trans. & Proc. Roy. Soc. New Zealand 79: 396, plate 80 F–H (1952).
Thelymitra longifolia J.R.Forst. & G.Forst. var. intermedia Hatch. Trans. & Proc. Roy. Soc. New Zealand 79: 396, plate 80 J (1952).
Was tagnamed T. "pseudopauciflora" for a time. Debate continues: T. colensoi appears to be a more delicate and slender flower than T. intermedia.
Thelymitra cyanea (Lindl.) Benth. Fl. Austral. 6: 323 (1873).
Macdonaldia cyanea Lindl. Bot. Reg. 25 (1840).
Thelymitra uniflora Hook.f. Bot. Antarct. Voy., Vol. 1, Fl. Antarct.: 70 (1844).
Thelymitra venosa as meant by Cheeseman. Man. New Zealand Fl. 671 (1906), is not that of R.Br. (1810).
Thelymitra venosa R.Br. var. typica Hatch Trans. & Proc. Roy. Soc. New Zealand 79: 390, plate 77 A–C (1952).
Thelymitra venosa R.Br. var. cedricsmithii Hatch Trans. & Proc. Roy. Soc. New Zealand 79: 390, plate 77 D–E (1952).
Thelymitra venosa R.Br. var. cyanea Hatch. Trans. & Proc. Roy. Soc. New Zealand 79: 391, plate 77 F–H (1952).
Thelymitra X **dentata**: a sterile hybrid of T. longifolia X T. pulchella.
Thelymitra dentata L.B.Moore. New Zealand J. Bot. 6: 478, f.2 (1969).
Thelymitra formosa Colenso. Trans. & Proc. New Zealand Inst. 16: 338 (1884).
Thelymitra circumsepta as meant by Hatch. NZNOG Journal 65: 8 (1997), is not that of Fitzg. (1878).
Thelymitra hatchii L.B.Moore. New Zealand J. Bot. 6: 477, f.2 (1969).
Thelymitra pachyphylla as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 79: 394, plate 79 D–H (1952), is not that of Cheeseman (1906).
Thelymitra aff. ixioides.
Thelymitra ixioides as meant by Hook.f. Handb. N. Zeal. Fl. 669 (1864), is not that of Swartz. (Kongl. Vetansk. Acad. Nya Handl. 21: 253, t.3, f.L [1800]).
Thelymitra ixioides var. typica (Hook.f.) Rupp & Hatch. Proc. Linn. Soc. New South Wales 70: 59 (1945).
Thelymitra longifolia J.R.Forst. & G.Forst. Char. Gen. Pl. 98 t.49 (1776).
Serapias regularis Banks & Sol. ex G.Forst. Prodr. 59 (1776).
Thelymitra forsteri Sw. Kongl. Vetensk. Acad. Nya Handl. 21: 228 (1800).
Thelymitra nemoralis Colenso. Trans. & Proc. New Zealand Inst. 17: 249 (1885).
Thelymitra alba Colenso. Trans. & Proc. New Zealand Inst. 18: 272 (1886).
Thelymitra cornuta Colenso. Trans. & Proc. New Zealand Inst. 20: 206 (1888).
Thelymitra longifolia J.R.Forst. & G.Forst. var. alba (Colenso) Cheeseman. Man. New Zealand Fl. 339 (1925).
Thelymitra longifolia J.R.Forst. & G.Forst. var. forsteri Hatch. Trans. & Proc. Roy. Soc. New Zealand 79: 396, plate 80 B–E (1952).

Thelymitra aristata as meant by Hatch. Trans. & Proc. Roy. Soc. New Zealand 79: 395, plate 79 M–N, plate 80 A (1952), is not that of Lindl. (1840), and has been tagnamed T. "tholinigra" by Scanlen.

Thelymitra aff. longifolia agg: some undescribed taxa that appear to be insect-pollinated.

Thelymitra malvina M.A.Clem., D.L.Jones & Molloy. Austral. Orchid Res. 1: 141 (1989).

Thelymitra matthewsii Cheeseman. Trans. & Proc. New Zealand Inst. 43: 177 (1911).

Thelymitra nervosa Colenso. Trans. & Proc. New Zealand Inst. 20: 207 (1888).
Thelymitra decora Cheeseman. Man. New Zealand Fl. 1151 (1906).

Thelymitra pauciflora R.Br. Prodr. 314 (1810).
Thelymitra pauciflora sens. strict. is in NZ according to Jeanes (Muelleria 19: 19–79 [2004]); however, there are also a number of forms in this aggregate.

Thelymitra pulchella Hook.f. Fl. Nov.-Zel. 1: 244 (1853).
Thelymitra fimbriata Colenso. Trans. & Proc. New Zealand Inst. 22: 490 (1890).
Thelymitra pachyphylla Cheeseman. Man. New Zealand Fl. 1151 (1906).
Thelymitra caesia Petrie. Trans. & Proc. New Zealand Inst. 51: 107 (1919).
T. pulchella is a very variable species, yet all of these appear to have features that are relatively stable in some populations. Thelymitra concinna Colenso. Trans. & Proc. New Zealand Inst. 20: 207 (1888) may belong here.

Thelymitra purpureofusca Colenso. Trans. & Proc. New Zealand Inst. 17: 249 (1885).
Thelymitra "Whakapapa": undescribed taxon from Ruapehu, that may correspond to T. purpureofusca, or may be distinct.

Thelymitra sanscilia Irwin ex Hatch. Trans. & Proc. Roy. Soc. New Zealand 79: 397, plate 81 B–E (1952).

Thelymitra tholiformis Molloy & Hatch. New Zealand J. Bot. 28: 111, f.6 (1990).
Thelymitra intermedia as meant by L.B.Moore. Fl. New Zealand Vol. 2: 129 (1970), is not that of Berggr. (1878).

Thelymitra "Ahipara": an unnamed taxon from the Far North, may be identical with T. "darkie".

Thelymitra "Comet": a large, late-flowering Thelymitra from the Kaweka range. Appears to be sterile, so probably a hybrid.

Thelymitra "darkie": undescribed taxon from the Far North (see McCrae. NZNOG Journal 24: 11; 77: 22 [1987]). May be identical with T. "Ahipara".

Thelymitra "rough leaf": undescribed taxon from the Far North (see McCrae. NZNOG Journal 24: 11; 77: 22 [1987]).

Thelymitra "sansfimbria": plain blue flowers from Far North (see Scanlen. NZNOJ 98: 36 & 102: 39, 45).

Thelymitra "sky": undescribed taxon from the Far North (see Scanlen. NZNOG 70: 30–35, f.6 [1998]).

Thelymitra "tholinigra": (see Scanlen. NZNOJ 85: 10, 15).

Townsonia Cheeseman. Man. New Zealand Fl. 692 (1906). Acianthus alliance

Townsonia deflexa Cheeseman. Man. New Zealand Fl. 692 (1906).
Townsonia viridis as meant by Schltr. Repert. Spec. Nov. Regni Veg. 9: 250 (1911), is not Acianthus viridis of Hook.f. (1860).
Acianthus viridis as meant by L.B.Moore. Fl. New Zealand Vol. 2: 107 (1970), is not that of Hook.f. (1860).

Waireia D.L.Jones, M.A.Clem. & Molloy. Orchadian 12(6): 282 (1997)

Waireia stenopetala (Hook.f.) D.L.Jones, M.A.Clem. & Molloy. Orchadian 12(6): 282 (1997).
Thelymitra stenopetala (Hook.f.) Bot. Antarct. Voy., Vol. 1, Fl. Antarct.: 69 (1844).
Lyperanthus antarcticus Hook.f. Bot. Antarct. Voy., Vol. 1, Fl. Antarct.: 544 (1847).

Winika M.A.Clem., D.L.Jones & Molloy. Orchadian 12(5): 214 (1997). Dendrobium alliance

Winika cunninghamii (Lindl.) M.A.Clem., D.L.Jones & Molloy. Orchadian 12(5): 214 (1997).
Dendrobium biflorum as meant by A.Rich. Essai Fl. Nov. Zel. 221 (1832), is not that of Sw. (1800).
Dendrobium cunninghamii Lindl. Bot. Reg. 21 sub. t.1756 (1835).
Dendrobium lessonii Colenso. Trans. & Proc. New Zealand Inst. 15: 326 (1883).

20 years of orchid mapping! The NZNOGJ began its mapping scheme in 1987, and identified records going back to 1972. These records have accumulated, and now in the hands of Mapping Coordinator Gordon Sylvester, will be published in the next issue.

Original papers

Chromosomes of New Zealand native orchids – part 2

By Murray Dawson, Landcare Research, Lincoln

Part 1 discussed newly published chromosome counts of the New Zealand native orchids, and the discovery of polyploid, allopolyploid, and aneuploid species [1].

In this second part, I change focus to consider the higher level (genus and above) implications of this work. These chromosome counts provide a valuable new set of characters that seem remarkably informative for the taxonomy (classification) and phylogeny (evolutionary reconstructions) of the New Zealand and Australian orchids.

Both articles summarise a paper that I published with my co-authors Brian Molloy and Ernst Beuzenberg in the December 2007 issue of the *New Zealand Journal of Botany* (NZJB) [2].

The genus problem

Readers of the NZNOG journal will be well-aware of the extraordinary number of name changes affecting the New Zealand orchids, especially at the genus level.

Many names have been reinstated or segregated out of long-standing and well-known Australasian orchid genera. For example, David Jones and Mark Clements of Canberra (and their co-authors) [3, 4] split *Corybas* (the spider and helmet orchids) into segregate genera including *Anzybas*, *Nematoceras*, and the New Zealand endemic genera *Molloybas* and *Singularybas*. Another well-known example is *Pterostylis* (the greenhood orchids), split into the segregate genus *Plumatichilos* by Dariusz Szlachetko of Poland [5], and then further subdivided by Jones and Clements into 15 segregate genera including *Diplodium*, *Hymenochilus* and *Linguella* [6, 7, 8]. To summarise some other changes:

Acianthus was split into *Cyrtostylis* and *Townsonia*;

Bulbophyllum was split into several genera including *Adelopetalum* and *Ichthyostomum*;

Caladenia was split into several genera including *Petalochilus* and *Stegostyla*;

Caleana/*Paracaleana minor* was dropped in favour of the reinstated genus *Sullivania*;

Chiloglottis was split into *Myrmechila* and *Simpliglottis*;

Dendrobium cunninghamii was transferred to a new genus, *Winika*;

Lyperanthus antarcticus was transferred to a new genus, *Waireia* (as *W. stenopetala*);

Prasophyllum nudum and *P. pumilum* were transferred to *Genoplesium* and then *Corunastylis*;

Yoania australis was transferred to a new genus, *Danhatchia*.

This multitude of proposed changes, compounded by a lack of consensus, has made it difficult to know what names to use. There are frequent references to this problem within the NZNOG journal [e.g., NZNOG 51:23; 92:7; 94:22; 97:24, 29; 102:46].

While some of the changes now seem to make sense and are generally accepted by most people (e.g., usage of *Danhatchia* and *Waireia*), others are complex and remain hotly debated.

A prime example of extensive and contentious changes is the range of genus-level treatments of *Caladenia* and its segregates. When commenting on the earlier work of Szlachetko [5], David Jones and his colleagues stated: "His treatment, which appears to be based on a very limited range of herbarium specimens, is superficial, skeletal and indicates a lack of

basic knowledge of the orchid groups involved" [9]. And they continue with other strong words. Hopper and Brown [10], in turn, also revise *Caladenia*, but argue for a conservative treatment and criticise both earlier works [5, 9]. And so the debate continues.

For New Zealand, Ian St George provides annual lists of the names that he accepts ("a personal opinion, wrested from observation, discussion, plagiarism and taxonomic punch-ups"!) [e.g., 11]. For our NZJB paper [2] we follow the taxonomic treatments of our co-author Brian Molloy. Brian works closely with his Australian colleagues, David Jones and Mark Clements, and together they have proposed the majority of the genus-level changes.

Characters and classification systems

Traditional taxonomic characters include vegetative (e.g., leaf size and shape) and reproductive (e.g., flower structures) characters. Because most traditional characters are relatively easy to observe and measure, they are known as macromorphological characters. These visible characters form the basis of traditional classifications and remain important to this day.

Classification systems are extensive hierarchies that operate not only at the genus and species level, but at higher (and lower) taxonomic levels too. For example, following one system, the ladies' tresses orchid *Spiranthes novae-zelandiae* belongs to subtribe Spiranthinae, which in turn is a member of tribe Cranichideae, of subfamily Orchidoideae, of family Orchidaceae.

Traditional classifications of the orchids have relied on a few key floral characters, such as anther configuration and column structure. This early reliance on floral characters created some artificial groupings due to parallel and convergent evolution well-known in the orchids. For the orchids, the best-known classification systems are those of Robert Dressler of the Missouri Botanical Garden. His most recent [12] was published in 1993, is still widely used, and includes discussion of other characters, including pollen, seed, and anatomical features to supplement traditional floral characters.

The next step in attempting to create a more natural (phylogenetic) classification system has been taken at the DNA level. From the early 1990s DNA sequencing has revolutionised our understanding of the relationships of plant groups. These invisible but highly informative characters are used to create what are called phylogenetic trees – reconstructions of the evolutionary relationships of species.

Orchid phylogenies were incorporated by Mark Chase of Kew and his colleagues into a new classification [13], published 10 years after Dressler [12]. The authors acknowledge that their 2003 classification is not the "final word", but it has been largely followed in the *Genera Orchidacearum* series. Production of this magnificent series is also based at Kew and coordinated by Alec Pridgeon; the editors have currently completed Vol. 4 [14] in a six-volume set.

However, molecular studies are open to interpretation and have not resolved all of the problems. Between studies there are differences in the gene regions used and the number of species sampled which may also produce differing results. For example, in the same year as Mark Chase et al's. classification [13], David Jones and his colleagues arrived at a markedly different arrangement for the Tribe Diurideae [15], yet both classifications used DNA sequences.

For our 2007 paper [2], we decided that a mixed classification system would best suit our needs. For the most part, we followed the system of Chase et al. [13], because it provided comprehensive coverage and incorporated the recent molecular work. However, for the tribe Diurideae, we followed the classification of Clements et al. [3] because it provided the best (but not a perfect) fit with the chromosome information. Table 1 shows our mixed classification, along with a summary of genus-level chromosome counts made by us and other workers. To show the full range of variation, chromosome numbers from genera shared by New Zealand, Australia, and other countries are included in the table (next page)

Table 1: Summary of chromosome numbers of orchid genera counted by Dawson et al. [2] and others. Adapted with permission from NZJB 45, pp. 670–671.

Classification	Genus	Dawson et al. [2]	Previous reports
Subfamily Epidendroideae			
Tribe Gastrodieae			
	Gastrodia	2*n* = 38–40, 40	2*n* = 16, 18, 22, 24, 30, 36
Tribe Vandeae			
Subtribe Aeridinae			
	Drymoanthus	2*n* = 38, 76	—
	Sarcochilus	2*n* = 38, 76	2*n* = (38), 76
(unplaced within the Epidendroideae)			
Subtribe Agrostophyllinae			
	Earina	2*n* = 40(+0–2)	—
Subtribe Dendrobiinae			
	Adelopetalum	2*n* = 36, 38	—
	Ichthyostomum	2*n* = 38	—
	Winika	2*n* = 40	2*n* = 38
Subfamily Orchidoideae			
Tribe Cranichideae			
Subtribe Goodyerinae			
	Danhatchia	2*n* = 22	—
Subtribe Pterostylidinae			
	Diplodium	2*n* = 50	2*n* = 50
	Linguella	2*n* = (48), 50	—
	Hymenochilus	2*n* = c. 48, 52, 54, 62	—
	Plumatichilos	2*n* = c. 52 (50–54)	—
	Pterostylis		
	subg. *Pterostylis*	2*n* = 42	2*n* = 42
	subg. *Cucullatae*	2*n* = 44, (46)	—
	subg. *Graminifoliae*	2*n* = 44	2*n* = 44
Subtribe Spiranthinae			
	Spiranthes	2*n* = 30	2*n* = 30 (most species); also: 2*n* = 20, 24, 26, 28, 44, 60, 74
Tribe Diurideae			
Subtribe Acianthinae			

Acianthus alliance		
Acianthus	2*n* = 40, 60–64	2*n* = 38
Cyrtostylis	2*n* = 44(+2)	2*n* = 44
Corybas alliance		
Molloybas	2*n* = 34	—
Singularybas	2*n* = 34	—
Anzybas	2*n* = 36	2*n* = 36
Nematoceras	2*n* = 36, 72	2*n* = 36
Corybas	2*n* = 54+2	—
Subtribe Adenochilidinae		
Adenochilus	2*n* = 38	—
Subtribe Caladeniinae		
Petalochilus	2*n* = 40 (39, 40, 41)	—
Stegostyla	2*n* = 47, 48	—
Subtribe Cryptostylidinae		
Cryptostylis	2*n* = 64	2*n* = 42, 56, c. 60, c. 187
Subtribe Diuridinae		
Orthoceras	2*n* = 40, 42, 44	—
Diuris	2*n* = 34, 36, 36–38	2*n* = 38, 56, c. 112
Subtribe Drakaeinae		
Myrmechila	2*n* = 40	2*n* = c. 40
Simpliglottis	2*n* = 40	2*n* = 40
Sullivania	2*n* = 54(+2)	—
Subtribe Megastylidinae		
Aporostylis	2*n* = 40	—
Waireia	2*n* = 40	—
Lyperanthus	2*n* = 44	—
Subtribe Prasophyllinae		
Corunastylis	2*n* = 44	—
Microtis	2*n* = 44, 88	2*n* = 44
Prasophyllum	2*n* = 42, 44, 64	2*n* = c. 40, c. 44
Subtribe Thelymitrinae		
Calochilus	2*n* = 22, 24	—
Thelymitra	2*n* = 26, 28, 36, 40, 45, 46, 52, 54, 57, 58, 60, 62, 65, 66, 70, 84, 93	2*n* = 26; 32, 56
Subtribe Townsoniinae		
Townsonia	2*n* = 28	—

Chromosome evidence

Size, shape, and number of chromosomes provide valuable characters independent of macromorphological and DNA data.

As mentioned previously [1, 2], chromosome counts of Australian representatives are still limited, and chromosome evidence on its own, particularly at higher taxonomic levels, has to be treated cautiously. However, what was surprising for the orchids was that for several groups the chromosome evidence strongly supports the recognition of at least some segregates (e.g., for some of the segregate genera of *Caladenia*, *Corybas*, *Prasophyllum*, and *Pterostylis*) and their subtribal placements.

We also found examples where none of the taxonomic treatments fully fitted the chromosome evidence. Some genera and subtribes remained chromosomally heterogeneous despite the fact that they have recently been revised. These may not be natural groups and may require further taxonomic revision and corroborative chromosome counts (e.g., within *Prasophyllum* as currently circumscribed).

What follows are some of the interesting case studies among New Zealand and related genera.

Subtribe Pterostylidinae: There is good chromosome support for segregating *Pterostylis* [7, 8]. Within the narrower definition of *Pterostylis*, subgenus *Pterostylis* is characterised by $2n = 42$ (admittedly based on limited counts) whereas the other two subgenera share $2n = 44$.

In contrast, the segregate genera *Diplodium* and *Linguella* are centred on $2n = 50$, *Hymenochilus* have a range of counts, $2n =$ c. 48, 52, 54, & 62, and *Plumatichilos* has $2n =$ 50–54.

Tribe Diurideae: The subtribes and genera that follow are all in tribe Diurideae (see Table 1 for an overview). As previously mentioned, we follow David Jones and Mark Clements treatment of this tribe [3, 15, 16] because they provide a better fit with our chromosome data compared with Chase et al.'s classification [13]. Jones and Clements split the tribe more finely and in many cases their subtribes are supported by differences in chromosome number and/or chromosome morphology.

Subtribe Acianthinae: *Acianthus* has $2n = 40$ and $2n =$ c. 60 whereas *Cyrtostylis* has $2n =$ 44–46; chromosomes of the other non-New Zealand genera of the *Acianthus* alliance are unknown. Although the chromosome numbers of *Acianthus* and *Cyrtostylis* differ, the chromosome size and morphology is similar. In contrast, chromosomes of the *Acianthus* alliance are smaller than those of the *Corybas* alliance.

There is support for at least some of the segregate genera of *Corybas* where they have different chromosome numbers. All share similar chromosome morphology indicating that they remain a relatively closely related group. *Molloybas* and *Singularybas* share $2n =$ 34, presumably derived through aneuploidy (loss of one chromosome pair) from $2n = 36$ found elsewhere in the *Corybas* alliance. *Anzybas* has $2n = 36$, the same as *Nematoceras* except for the *N. trilobum* agg., which has both $2n = 36$ (diploid) and $2n = 72$ (tetraploid) representatives. Interestingly, *Corybas* in the restricted sense [4] differs with $2n = 54+2$ (or $2n = 56$) chromosomes.

Subtribe Adenochilidinae: This subtribe contains only one genus, *Adenochilus*, and was recently separated from subtribe Caladeniinae [15]. We counted one of the two species, *Adenochilus gracilis*, with $2n = 38$, a number that differs from those known in Jones et al.'s concept of Caladeniinae [15].

Subtribe Caladeniinae: This subtribe has had major recircumscriptions [3, 17], where 10 segregate genera were recognised from *Caladenia*, and several other genera were transferred to the new subtribes Adenochilidinae and Megastylidinae. There is strong chromosome support for some of the segregate genera, which may help settle the debate surrounding these recircumscriptions.

We counted New Zealand species from

two segregates of *Caladenia*, namely *Petalochilus* and *Stegostyla*. Although *Petalochilus* has $2n = 40$ (with some aneuploidy), there are two different chromosome types (cytotypes) within this genus, suggesting that it may not be a natural group. One cytotype has small chromosomes (*P.* aff. *carneus* and *P. minor* with $2n = 40$) and the other has chromosomes with different morphology and of a larger size (seen in only *P. chlorostylus* with $2n = 39, 40, 41$). Further work is needed to reconcile these differences between chromosome number and the existing taxonomy.

Stegostyla lyallii of New Zealand has $2n = 47, 48$, but again, further chromosome counts are needed of other species to determine if this is a consistent difference that supports the separation of *Stegostyla* at the genus level.

Peakall and James [18] counted chromosomes of several Australian orchids. Updating the names that they used with the subsequent generic recircumscriptions of *Caladenia* suggests that there is chromosome support for some of the other segregate genera in Australia. *Caladenia* (in the restricted sense) has $2n = 48$, *Arachnorchis* has mainly $2n = 44$, *Leptoceras* has $2n = 44$, and *Jonesiopsis* has $2n = 46$. Our counts, in conjunction with those of Peakall and James [18], appear to form an aneuploid series that characterises and strongly supports many of the segregate genera in subtribe Caladeniinae.

Subtribe Cryptostylidinae: Following Clements et al. [3], this subtribe is made up of only one genus, *Cryptostylis*, but there is nevertheless an interesting range of chromosome numbers. *Cryptostylis subulata* from New Zealand has $2n = 64$ [2] whereas two Australian species have $2n = 56$ and a high polyploid count of $2n =$ c. 187 [18]. Also, one species from Thailand has $2n = 42$ [19]. Like so many other groups, further chromosome counts are needed.

Subtribe Diuridinae: *Diuris* and *Orthoceras* are the only genera that Jones and Clements recognise in this subtribe [3, 15, 16], although Dressler [12] and Chase et al. [13] included *Epiblema*. Chromosomally, *Diuris* and *Orthoceras* are quite different from one another even though they constitute a well-supported group in a molecular analysis [3].

Orthoceras has about six species but several are undescribed. We counted two species; most have $2n = 42$, but we also obtained $2n = 40$ and $2n = 44$. The chromosomes were small and it is uncertain if this narrow range of numbers represents real variation. Ours are the only known chromosome counts for this genus.

Diuris is absent from New Zealand and centred in Australia. In contrast to *Orthoceras*, *Diuris* is more species-rich and has much larger chromosomes and a wider range of numbers – various species have $2n = 34, 36, 36–38$ [2], and $2n = 38, 56,$ c. 112 [18].

Subtribe Drakaeinae: *Myrmechila* and *Simpliglottis* are two segregate genera of *Chiloglottis* [5, 20]. *Myrmechila trapeziformis* (from both sides of the Tasman) and *Simpliglottis* (*S. cornuta* and *S. valida* counted from New Zealand) have $2n = 40$ with similar chromosomes.

Sullivania minor differs markedly with $2n = 54(+2)$. *Sullivania* is a recently reinstated genus [20].

The only other chromosome counts in subtribe Drakaeinae are for two Australian genera and species (*Spiculaea ciliata*, $2n =$ c. 40; *Drakaea glyptodon*, $2n =$ c. 44) [18]. Chromosome counts are lacking in this subtribe and *Chiloglottis* in the restricted sense [20] does not appear to have been counted yet (Fig. 1).

Subtribe Megastylidinae: This new subtribe was created by Jones et al. [15] to accommodate eight genera formerly placed in subtribes Caladeniinae (*Aporostylis*) and Thelymitrinae (*Burnettia*, *Leporella*, *Lyperanthus*, *Megastylis*, *Pyrorchis*, *Rimacola*, and *Waireia*).

Chromosome evidence supports removal of at least some genera from their previous placements in other subtribes, but clearly divides the Megastylidinae into at least two

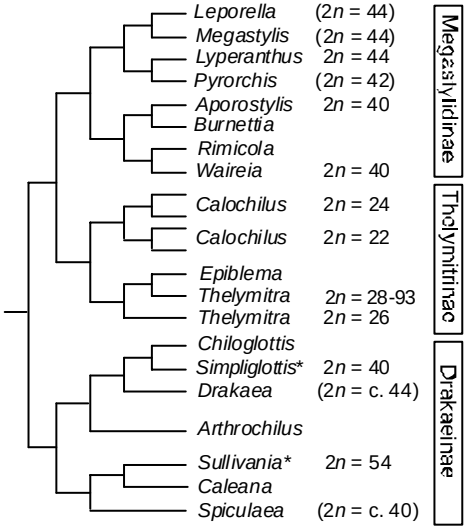


Fig. 1 An example of comparing independent chromosome information with a classification based on molecular data. Portion of a molecular analysis of the Diurideae adapted from Clements et al. [3]. Chromosome numbers added by Dawson et al. [2]. Reproduced with permission from NZJB 45, p. 674.

(probably three) groups (Fig. 1). The first group has $2n = 40$ moderately small chromosomes and is represented by *Aporostylis* and *Waireia* of New Zealand. *Waireia stenopetala* used to be placed in *Lyperanthus* (as *L. antarcticus*). This earlier placement in *Lyperanthus* was quite wrong as the chromosomes are completely different – we knew this well before *Waireia* was created in 1997 [21].

The second well-defined group has the longest orchid chromosomes that I have examined. This group is represented by the Australian *Lyperanthus suaveolens* ($2n = 44$) [2] and *Pyrorchis* ($2n = 42$) [18]. The chromosome number of *Pyrorchis* may be derived through aneuploid reduction of a $2n = 44$ ancestor; the *Aporostylis* and *Waireia* cytotype, characterised by $2n = 40$, probably has an independent origin.

Like *Lyperanthus*, two other non-New Zealand genera have $2n = 44$; *Leporella fimbriata* of Australia [18] and *Megastylis gigas* of New Caledonia [22]. However, the published chromosome illustrations appear to show only moderately sized chromosomes, so maybe there is a third group within the Megastylidinae.

Subtribe Prasophyllinae: Several segregate genera are recognised in this subtribe [15, 23]. Within the recircumscribed *Prasophyllum*, most species have $2n = 42$ (although *P. rogersii* from Australia has $2n = 64$). However, there is still a component of *Prasophyllum* with $2n = 44$ and a smaller chromosome complement (found in *P. australe* and *P. brownii* from Australia).

Corunastylis was segregated from *Prasophyllum* and there is support for this – New Zealand material of *Corunastylis nuda* and *C. pumila* share a different chromosome number ($2n = 44$) and have distinctly smaller chromosomes than most of *Prasophyllum*.

Mecopodum, an Australian segregate genus of *Prasophyllum*, has $2n = 44$ (counted under its earlier name, *Prasophyllum parvifolium* [18]). *Microtis* also has $2n = 44$, except for the tetraploid species *M. unifolia*. Again, further chromosome counts are needed and the other Australian genera in subtribe Prasophyllinae remain uncounted.

Subtribe Thelymitrinae: Chromosome evidence strongly supports tribal treatments that accept only *Calochilus*, *Thelymitra*, and the chromosomally unknown *Epiblema* (3, 4, 16; Fig. 1). Chromosomes of *Calochilus* and *Thelymitra* are quite distinctive from other genera, and chromosome evidence (where known) does not support Chase et al.'s [13] treatment that included 12 other genera.

Calochilus paludosus and *C. robertsonii* have $2n = 24$, and *C.* aff. *herbaceus* of New Zealand has $2n = 22$. The lower number is probably derived through aneuploidy within *Calochilus*. In turn, $2n = 24$ may be derived from reduction of a $2n = 26$ chromosome complement found in *Thelymitra*.

The wide range of chromosome numbers

(2*n* = 26–93), limited aneuploidy, extensive allopolyploidy, and reticulate evolution within *Thelymitra* was discussed in my previous article [1]. The occurrence of intergeneric hybrids between *Calochilus* and *Thelymitra* and similar chromosome complements suggest that the two genera are closely related.

Subtribe Townsoniinae: This subtribe is made up of only one genus, *Townsonia*, and has been separated from subtribe Acianthinae [4]. One of the two species is counted, *T. deflexa* with 2*n* = 28. Both species (*T. deflexa* endemic to New Zealand and *T. viridis* endemic to Tasmania) were formerly placed in *Acianthus* (under the one name, *A. viridis*), but the distinctive chromosome number and long chromosomes characterising *Townsonia* provide independent support for the removal of the species from *Acianthus* and from subtribe Acianthinae.

Concluding remarks

All of these case studies show the usefulness of the new chromosome information. Admittedly, many more counts are needed for the Australian species, and for some segregate genera there is little (if any) difference between their chromosome morphology/number and the genus to which they belonged. For these, their status can neither be confirmed nor rejected by the chromosome evidence.

Examples where chromosome counts are relatively uninformative include *Adelopetalum* (2*n* = 36, 38) and *Ichthyostomum* (2*n* = 38), both segregates of *Bulbophyllum*, the most species-rich orchid genus. The commonest chromosome number in *Bulbophyllum* is 2*n* = 38 (followed by 2*n* = 40). Likewise, *Winika* (2*n* = 40) is a segregate of *Dendrobium*, and (like *Bulbophyllum*) is a species-rich member of Subtribe Dendrobiinae with predominantly 2*n* = 38 and secondarily 2*n* = 40. In these examples, macromorphology and DNA evidence is more helpful in supporting them as segregate genera.

Chromosomes are relatively conservative characters, i.e., they do not generally change much over time, so it is not uncommon to have closely related genera sharing the same count and chromosome morphology. However, because they are conservative characters, major differences in chromosome complements, such as those highlighted here, are quite significant from a taxonomic and a phylogenetic viewpoint. The new chromosome information provides an independent set of characters that should, in conjunction with traditional and molecular characters, assist in greater long-term stability of the Australasian orchid names and classifications.

References

1. Dawson MI 2008. Chromosomes of New Zealand native orchids – part 1 of 2. New Zealand Native Orchid Group Journal 108: 16–20.
2. Dawson MI, Molloy BPJ, Beuzenberg EJ 2007. Contributions to a chromosome atlas of the New Zealand flora – 39. Orchidaceae. New Zealand Journal of Botany 45: 611–684.
3. Clements MA, Jones DL, Sharma IK, Nightingale ME, Garratt MJ, Fitzgerald KJ, Mackenzie AM, Molloy BPJ 2002. Phylogenetics of Diurideae (Orchidaceae) based on the Internal Transcribed Spacer (ITS) regions of nuclear ribosomal DNA. Lindleyana 17: 135–171.
4. Jones DL, Clements MA, Sharma IK, Mackenzie AM, Molloy BPJ 2002. Nomenclatural notes arising from studies into the tribe Diurideae (Orchidaceae). The Orchadian 13: 437–468.
5. Szlachetko DL 2001. Genera et Species Orchidalium 1. Polish Botanical Journal 46: 11–26.
6. Jones DL, Clements MA 2002. 1. A reassessment of *Pterostylis* R.Br. (Orchidaceae). In: Jones DL, Clements MA ed. A review of *Pterostylis* (Orchidaceae). Australian Orchid Research 4: 3–63.
7. Jones DL, Clements MA 2002. 2. A new classification of *Pterostylis* R.Br. (Orchidaceae). In: Jones DL, Clements MA ed. A review of *Pterostylis* (Orchidaceae). Australian Orchid Research 4: 64–124.
8. Jones DL, Clements MA, Molloy BPJ 2002. 3. A synopsis of the Subtribe Pterostylidinae. In: Jones DL, Clements MA ed. A review of *Pterostylis* (Orchidaceae). Australian Orchid Research 4: 125–144.
9. Jones DL, Clements MA, Sharma IK, Mackenzie AM 2001. A new classification of *Caladenia* R.Br. (Orchidaceae). The Orchadian 13: 388–420.
10. Hopper SD, Brown AP 2004. Robert Brown's *Caladenia* revisited, including a revision of its sister genera *Cyanicula*, *Ericksonella* and *Phe-*

ladenia (Caladeniinae: Orchidaceae). Australian Systematic Botany 17: 171–240.
11. St George I 2007. The New Zealand orchids. New Zealand Native Orchid Group Journal 106: 18–27.
12. Dressler RL 1993. Phylogeny and classification of the orchid family. Cambridge University Press. 314 p.
13. Chase MW, Cameron KM, Barrett RL, Freudenstein JV 2003. DNA data and Orchidaceae systematics: a new phylogenetic classification. In: Dixon KW, Kell SP, Barrett RL, Cribb PJ ed. Orchid conservation. Kota Kinabalu, Sabah, Natural History Publications (Borneo). Pp. 69–89.
14. Pridgeon AM, Cribb PJ, Chase MW, Rasmussen FN ed. 2005. Genera Orchidacearum. Volume 4. Epidendroideae (Part 1). Oxford University Press. 672 p.
15. Jones DL, Clements MA, Sharma IK, Mackenzie AM, Molloy BPJ 2002. Nomenclatural notes arising from studies into the tribe Diurideae (Orchidaceae). The Orchadian 13: 437–468.
16. Clements MA, Jones DL 2002. Nomenclatural notes arising from studies into the Tribe Diurideae (Orchidaceae): additions and corrections. The Orchadian 13: 502–503.
17. Jones DL, Clements MA, Sharma IK, Mackenzie AM 2001. A new classification of *Caladenia* R.Br. (Orchidaceae). The Orchadian 13: 388–420.
18. Peakall R, James SH 1989. Chromosome numbers of some Australian terrestrial orchids. Lindleyana 4: 85–88.
19. Larsen K 1966. Studies in the Flora of Thailand. 40. Cytology of vascular plants. II. Dansk Botanisk Arkiv 23: 375–399.
20. Jones DL, Clements MA 2005. Miscellaneous nomenclatural notes and changes in Australian, New Guinea and New Zealand Orchidaceae. The Orchadian 15: 33–42.
21. Jones DL, Clements MA, Molloy BPJ 1997. *Waireia*, a new genus of Orchidaceae from New Zealand. The Orchadian 12: 282–287.
22. Ishida G, Sera T, Hashimoto K 1992. Chromosome numbers of some orchids from New Caledonia. Bulletin of the Hiroshima Botanical Garden 14: 47–50.
23. Jones DL, Clements MA 2004. Miscellaneous new species, new genera, reinstated genera and new combinations in Australian Orchidaceae. The Orchadian, Scientific Supplement 14: i–xvi.

The library of the Swiss Orchid Foundation at the Herbarium Jany Renz

The **Renz library** is one of the finest and most complete orchid libraries, and is a cultural asset, now with a worldwide accessibility. The Renz library is a comprehensive reference collection of orchid literature, which serves as excellent basis for research, conservation and horticulture. The collection contains over 3,000 volumes, including an irreplaceable collection of rare and antique folio volumes, which are considered to be among the best preserved copies in the world.

A complete reference of modern literature is a precious resource for the study of orchids, the largest family of flowering plants. The collection contains around 5,000 scientific articles from many sources and represents an extraordinary comprehensive and versatile collection of literature on orchids. The complete library was incorporated into the online catalogue of the University Library of Basel and is now available at http://aleph.unibas.ch

Some 90 select illustrated orchid books, containing over 7000 hand-coloured drawings, have been digitized during the last five years and may be accessed online on the website of the Swiss Orchid Foundation http://www.orchid.unibas.ch (see 'orchid books'). The rarity, originality and quality of these hand-coloured drawings is an invaluable source of information and proves that scientific precision and artistic efforts are not mutually exclusive. Scientific illustration is irreplaceable for exact documentation, as neither computer science nor photography is able to present such a large amount of accurate and

aesthetic information on a single sheet of paper. A large number of the hand-coloured drawings were used for first descriptions and are thus important for the interpretation of the scientific names of orchids.

In addition to the illustrations, over 52,000 photographs of orchids from around the world have been scanned and their identity and names checked: they are available through the website of the Swiss Orchid Foundation. Herbarium specimens, drawings or photographs of all orchids from Europe, Asia Minor, North Africa and North America are available online. Images of many other Asian, Australasian, African, Madagascan and tropical American orchids are also available. This **World Orchid Iconography** an important tool to obtain identifications and nomenclatorial information on orchids.

Furthermore, the Foundation's website provides free access to **BibliOrchidea,** a comprehensive literature database with more than 140,000 entries, covering over 80% of the orchid literature available worldwide. The database is continually expanded and kept up-to-date by the eminent orchid specialist Dr. Rudolph Jenny. Scientists, horticulturists and conservationists, both professional and amateur, can find publications easily, either by searching for a specific title, author or year of publication or by browsing through a comprehensive list of keywords. First descriptions may be found by specifying the taxon (genus, species, subspecies, and variety). All results are accompanied by appropriate images from the Swiss Orchid Foundation database.

Sources of the digitized drawings

- A Century of Indian Orchids (J. D. Hooker)
- A Century of Orchidaceous Plants Vol. 1 (William Jackson Hooker)
- A Second Century of Orchidaceous Plants (James Bateman)
- Album des Orchidées d'Europe Deuxième Edition (Henry Correvon)
- Australian Orchids Vol. 1 & 2 (R. D. Fitzgerald)
- Bluetenanalysen neuer Orchideen, III. Afrikanische und madegassische Orchideen 3 (R. Schlechter)
- Collectanea Botanica (John Lindley)
- Dictionnaire Iconographique des Orchidees (Alfred Cogniaux; Alphonse Goossens)
- Die Orchidaceen Deutschlands, Deutsch-Oesterreichs und der Schweiz (Max Schulze)
- Die Orchidee, Vol. 56(6), 2005 (Otto Möller)
- Die Orchideen Deutschlands und der angrenzenden Gebiete (Erich Nelson)
- Die Orchideen Europas (Helmut Baumann; S. Kuenkele; R.Lorenz)
- Die Orchideen von Java (& Figurenatlas Vol. 1) (Johann Jacob Smith)
- Die Orchideen von Rhodos und Karpathos (C. A. J.Kreutz)
- Die Orchideengattungen Anacamptis, Orchis, Neotinea (H. Kretzschmar; W. Eccarius; H. Dietrich)
- Flore de Madagaskar, Plantes Vasculaires, 49 Famille - Orchidees Vol. 1 & 2 (Joseph Marie Alfred Henri Perrier de la Bâthie,)
- Flore Illustree de Nice et des Alpes-Maritimes, Iconographie des Orchidees (Jean-Baptiste Barla)
- Forest Orchids of West Africa (C.W. Chew)
- Genera and Species of Orchidaceous Plants Part IV (John Lindley)
- Genera et species orchidearum et asclepiadearum quas in itinere per insulam Java vol. 1-3 (Heinrich Kuhl; Johan Coenraad van Hasselt; Jacob Gijsbertus Samuël van Breda)
- Icones Orchidearum Austro-Africanarum Volume 1 " 2 (Harry Bolus)
- Icones Plantarum Helvetiae (Albertus von Haller)
- Icones Plantarum Japonicarum (Carolus Petrus Thunberg)
- Iconografia delle Orchidee d'Italia (Text: Walter Rossi /Plates: Anne Elderedge Maury)
- Iconographie des Orchidees du Brésil (João Barbosa Rodrigues)
- Illustrations of Orchidaceous Plants (Thomas Moore)

- Lindenia Iconographie des Orchidées (All Volumes) (Lucien Linden & Emile Rodigas)
- Monographie des Orchidées des Iles de France et de Bourbon Vol. 1 (Achille Richard)
- Orchideées du Departement de la Marne (Ch. Richon)
- Orchideen Deutschland (Walter Müller; F. Kränzlin)
- Orchidees de Magagascar, Orchidaceae Perrierianae Madagascariensis (Friedrich Richard Rudolf Schlechter)
- Orchidées des Iles Australes d'Afrique Vol. 1 (Louis Marie Aubert du Petit-Thouars)
- Orchids and how to grow them Vol. 1 (Samuel Jennings)
- Orchids of Africa, A Select Review (Text by J. Stewart ; Ill. by E.F. Hennessy)
- Orchids of Australia Vol. 1 (W.H. Nicholls)
- Orchids of South-Africa, Icones Orchidearum Austro-Africanarum, Vol.III (Harry Bolus)
- Paxton's Flower Garden, Vol. 1 - 3 (John Lindley; Joseph Paxton)
- Poeppig et Endlicher, Nova Genera Plantarum Vol. 1 & 2 (Eduardus Poeppig & Stephano Endlicher)
- Reichenbachia. Orchids illustrated and described (Frederick Sander)
- Rumphia Band 4 (Carl Ludwig Blume)
- Select Orchidaceous Plants First - Third Series (Robert Warner)
- Sertum Orchidaceum (John Lindley)
- Southern African epiphytic orchids (John S.Ball)
- The Genus Masdevallia (Florence Woolward)
- The native Orchids of Florida (Carlyle A.Luer)
- The native Orchids of the United States and Canada excluding Florida (Carlyle A.Luer)
- The Orchid Album Vol. 1 - 11 (Robert Warner; Benjamin Samuel Williams; T.Moore)
- The Orchidaceae of Mexico & Guatemala (James Bateman)
- The Orchids of the Cape Peninsula 2 (Harry Bolus)
- The Orchids of the Sikkim-Himalaya Vol. 1 - 3 (G. King and R. Pantling)
- The Slipper Orchids : Selenipedium, Phragmipedium, Criosanthes, Cypripedium, Paphiopedilum (Esmé Franklin Hennessy)
- Xenia Orchidacea (H.G. Reichenbach, F. Kraenzlin)

Orchids of Arthurs Pass and Otira River areas ED 53.2 and 50.02

by Gordon Sylvester.

My article on this area published in Journal 109 referred to the information I had accumulated from various sources. Our Editor pointed out to me another article that was not referred to: I had located the week before he emailed the relevant information to me. In order to make the information for the area as complete as possible the lists below are now appended for your information.

A checklist published in the New Zealand Journal of Botany 1986 vol 24: 9-68 by C. J Burrows listed several species. This is the third such list I have seen for this general area.

Over several years commencing 2004 I have briefly looked at roadsides to gain an insight in the orchid populations. While there has never been any attempt to penetrate more than 80m from the roadside, I have noted the following species; the general site of the record is also recorded.

Kelly's Stream 2007

Earina autumnalis	*Chiloglottis cornuta*
Pterostylis montana	*Pt. oliveri*
Pt. australis	*Pt. irsoniana*
Pt. australis X	*Pt. oliveri* X
Pt. graminea agg	*Nematoceras macranthum*
Nem hypogeaum	*Nem longipetalum*
Nem trilobum	*Nem acuminatum*

Otira Valley above Pegleg Bend

Aporostylis bifolia	*Stegostyla lyallii*
Waireia stenopetala	*Prasophyllum colensoi*

Temple Basin Car park and ski field lift areas

Pterostylis australis	*Stegastyla lyallii*
Gastrodia cunninghamii	*Aporostylis bifolia*
Stegastyla aff. *alpina*	*Prasophyllum* "B"
Pterostylis venosa	

I have not seen *Pt. venosa* but have no reason to doubt is authenticity

Burrows recorded in 1989

Adenochilis gracilis	*Aporostylis bifolia*
Caladenia lyallii	*Chliglottis cornuta*
Corybas macranthus	*Corybas oblongus*
Corybas rivularis	*Corybas trilobus*
Dendrobium cunninghamii	*Earina autumnalis*
Gastrodia cunninghamii	*Lyperanthus antarcticus*
Microtis oligantha	*Microtis unifolia*
Prasophyllum colensoi	*Pterostylis areolata*
Pterostylis australis	*Pterostylis banksii*
Pterostylis irsoniana	*Pterostylis montana*
Pterostylis mutica	*Pterostylis oliveri*
Pterostylis venosa	*Thelymitra hatchii*
Thelymitra longifolia	*Thelymitra venosa*

Other records have included

1893 Petrie D. Proc.N.Z.I XXVI 266-279
Kelly's Creek: *Gastrodia sesamoides; Pterostylis oliveri*

1929 RM Laing & WRB Oliver Trans R.S.N.Z. 59 715-730
Upper Bealey River: *Chiloglottis cornuta; Aporostylis bifolia; Gastrodia cunninghamii; Prasophyllum colensoi; Lyperanthus antarcticus; Pterostylis oliveri; Thelymitra unifolia; Corybas trilobus; Caladenia lyallii; Corybas rotundifolius; Pterostylis areolata*.

1935 Laing and Gourlay H.W. Trans R.S.N.Z. 64 1-10
Bealey River Basin: *Pterostylis graminea; Pterostylis australis; Pterostylis banksii; Microtis unifolia; Thelymitra hatchii*.

1962 C.J. Burrows Trans.R.S.N.Z. Bot. 1 (15) 195-216
Waimakariri Basin: *Aporostylis bifolia; Corybas oblongus; Corybas trilobus; Corybas macranthus; Lyperanthus antarticus; Microtis magnadenia; Microtis parviflora; Microtis unifolia; Pterostylis australis; Pt. areolata; Pt. mutica; Pt. oliveri; Pt. graminea; Pt. montana; Pt. irson-*

iana; Pt cynocephala; Pt. venosa; Chiloglottis cornuta; Thelymitra venosa; Thelymitra pachyphylla; Thelymitra uniflora; Thelymitra longifolia; Caladenia lyallii; Prasophyllum colensoi; Adenochilis gracilis; Acianthus reniformis; Gastrodia cunninghamii.

Var dates 2007 1988 Gordon Sylvester and Thom Pendrigh unpublished data
Greynes Shelter and Track*: Nematoceras trilobum; Chiloglottis cornuta; Pterostylis oliveri; Pterostylis graminea* agg*; Pterostylis irsoniana;*

Scotts Track: 1988 Thom Pendrigh NZNOG Journ 25:11
Townsonia deflexa; Thelymitra hatchii;Pterostylis oliveri: Pterostylis banksii X *Pterostylis oliveri.*

Bridal Veil Falls Track: 1988 Thom Pendrigh NZNOG Journ 25:11
Aporostylis bifolia; Prasophyllum colensoi; Townsonia deflexa; Nematoceras trilobum; Pterostylis oliveri; Waireia stenopetala.

Orchid species recorded in the Arthurs Pass area ED 50.02 and 53.02 covering the area from Aikens to Grassmere Lodge.

Acianthus reniformis = Cyrtostylis reniformis
Adenochilis gracilis
Aporostylis bifolia
Caladenia lyallii = Stegostyla lyallii
Chiloglottis cornuta
Corybas acuminatus = Nematoceras acuminatum
Corybas macranthus = Nematoceras macranthum
Corybas oblongus = Singularybas oblongus
Corybas rivularis = Nematoceras rivulare agg.
Corybas rotundifolius = Nem. rivulare agg.
Corybas trilobus = Nematoceras trilobum agg.
Dendrobium cunninghamii = Winika cunninghamii
Earina autumnalis
Gastrodia cunninghamii
Gastrodia sesamoides. = Gas. aff *sesamoides*
Lyperanthus antarcticus = Waireia stenopetala
Microtis magnadenia = Microtis parviflora
Microtis oligantha
Microtis parviflora
Microtis unifolia
Nem hypogaeum
Nem longipetalum
Prasophyllum "B"
Prasophyllum colensoi
Pt. australis X
Pt. oliveri X
Pterostylis areolata.
Pterostylis australis
Pterostylis banksii
Pterostylis banksii X *Pterostylis oliveri*
Pterostylis cycnocephala = Pterostylis tanypoda
Pterostylis graminea
Pterostylis graminea agg
Pterostylis irsoniana
Pterostylis montana
Pterostylis mutica = Pterostylis tristis
Pterostylis oliveri
Pterostylis venosa
Stegostyla aff. *alpina*
Thelymitra hatchii
Thelymitra longifolia
Thelymitra pachyphylla = Thelymitra fimbriata
Thelymitra uniflora = Thelymitra cyanea
Thelymitra venosa = Thelymitra cyanea
Townsonia deflexa

Watch for notice of a field trip to Cass, nr. Arthurs Pass, to be organized by Gordon Sylvester for December-January 2009

Historical note

Fragrant and brightly coloured *Microtis*

On 20 July 1841 William Colenso wrote to WJ Hooker with a plant list, and annotated one of them as follows...

- 81. A n. sp., of *Microtis*, found on the high and barren hills near Wangarei. Differing from *M. Banksii*, not only in appearance, but in its *time* of flowering, *this* coming out in the autumn, *that* in the spring. This is also *smaller* and its *flowers* are beautifully & delicately coloured with crimson and purple; whilst those of *M. Banksii* are green, or greenish yellow. Its sheathing fistulous scape, too, is not so long as its spike of Inflorescence, while in *M. Banksii,* it is a very great deal longer. The flowers of this n. sp., are often coalesced together, and are not so numerous as in *M. Banksii*. I subsequently found this, (on returning) on the high table land near Owae. The dry specimens are from the former, those in acid from the latter place, March, 1841.

WJ Hooker seems to have ignored it, but JD Hooker eventually described ***Prasophyllum nudum*** (*Corunastylis nuda*) in 1853, from 3 plants Colenso had collected from Wellington and Taupo. These were plants Colenso had sent in September 1847, with the following notations

- 1021. Microtis, n. sp., with a beautifully coloured perianth; only one found, nr. Taupo Lake.
- 1134. Microtis?n. sp., found growing with foregoing (1133 was collected from "dry clayey hills, S.E. head, P. Nicholson harbour"); only 2 specimens obtained, Autumn (April) 1847. – But compare with no. 1021.

On 24 January 1842 he was near Te Awamutu, and later that year wrote, "Leaving the swamp and entering on the plain beyond it, I discovered a new and elegant plant of the *Orchideæ* family and genus *Microtis*, possessing a beautiful carmine-coloured perianth, with pubescent scape and spike (203). It was, however, very scarce, and only grew in one low spot by the path-side. Most of the plants had flowered; but I was fortunate enough to procure two specimens that were still in blossom."

That one had to be *Spiranthes*.

Later he sent further specimens, such as

- 2404. *Microtis*, large stout sp., Taupo plain.

That was identified by Cheeseman as *Prasophyllum colensoi*, but I wonder what these were ?

- 4115. Microtis, another pretty species, sides of mountain streams, near Mokaipatea, E. side of Ruahine. Gathered in March, 1852. M. alpina, W.C.
- 4516. (Orchis) – hills, interior, 2 specimens; and 1 of a small Microtis having only 3 flowers on.

That last has to be *M. oligantha* surely, but *M. oligantha* was described by Lucy Moore only a few years ago, in 1969!

Colenso thought most of the Prasophyllum alliance, and seemingly even *Spiranthes*, were *Microtis*. But he had a sophisticated eye for the differences among them!

On Christmas Day 1875 he wrote to Cheeseman, "I remember a gem! which pleased me much: I never found it but once, but then it was plentiful and in a good state. I took it to be a *Microtis*, & named it *M. autumnale*, – it was coloured purple & yellow, & very *sweet scented*! – it grew with *Thelymitra Colensoi*. It is *not* one of Dr. Hooker's *Prasophylla*."

I have yet to find any earlier reference to the name "M. autumnale", but I wonder whether that was *Prasophyllum hectorii*, the only sweet-scented possibility in my lexicon.

Elementary: ED Hatch

19. Miscellaneous terrestrials 8.

Drawings by Bruce Irwin

Prasophyllum

(leek-leaved)

Plants with a single, hollow-tubular leaf, (cf *Microtis* and *Corunastylis*,) and a raceme of small flowers which are "upside down", with the labellum uppermost

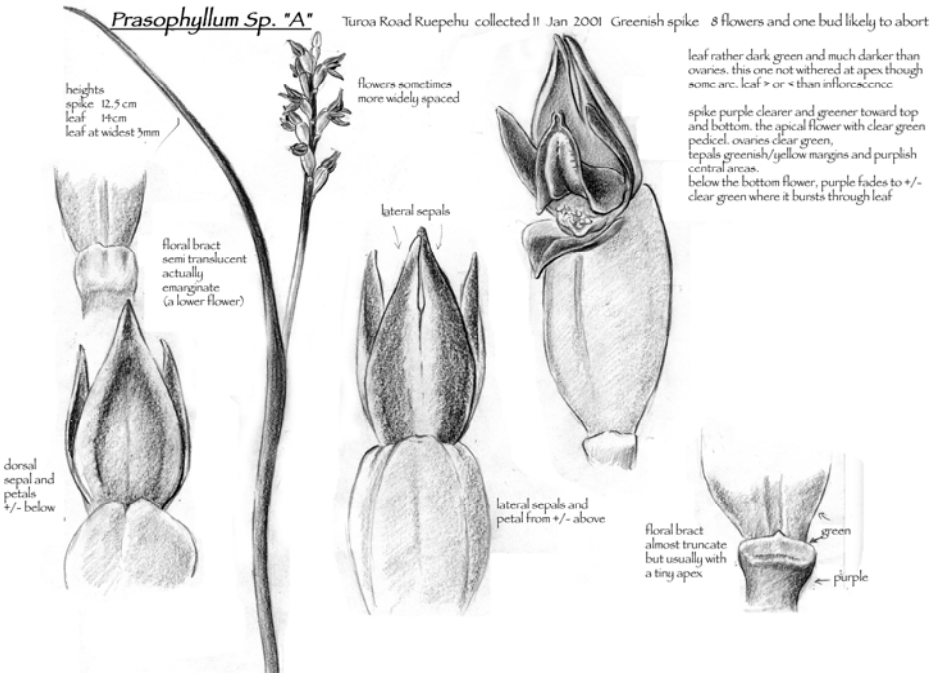
23: *Prasophyllum colensoi*

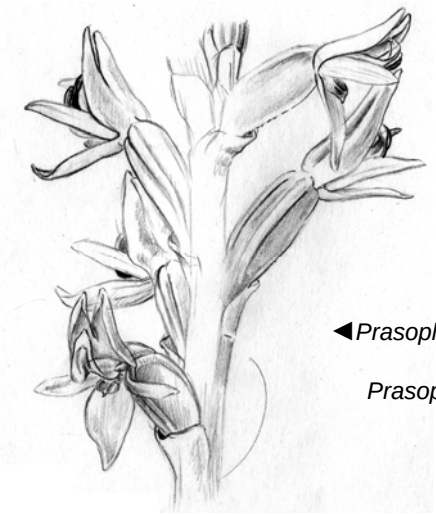
(for William Colenso)

A very wide ranging species, occurring from sea level to the sub-alpine scrub, and from the sub-tropics to the sub-Antarctic. Considerable variation in form and colour is therefore to be expected, and the complex almost certainly contains several valid species

Distribution – endemic – North, South, Stewart, Chatham, Antipodes, Auckland and Campbell Is.

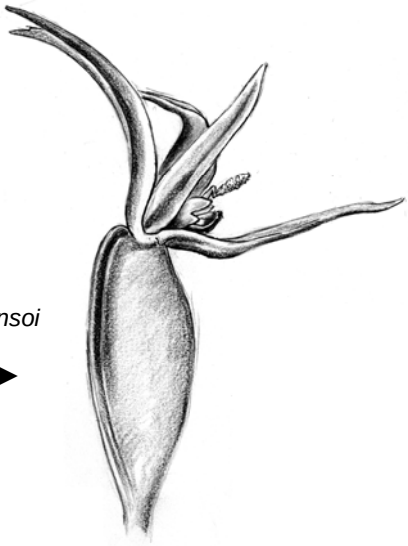
Flowers – October-January – self pollinated.





◀*Prasophyllum colensoi*

Prasophyllum "B"▶



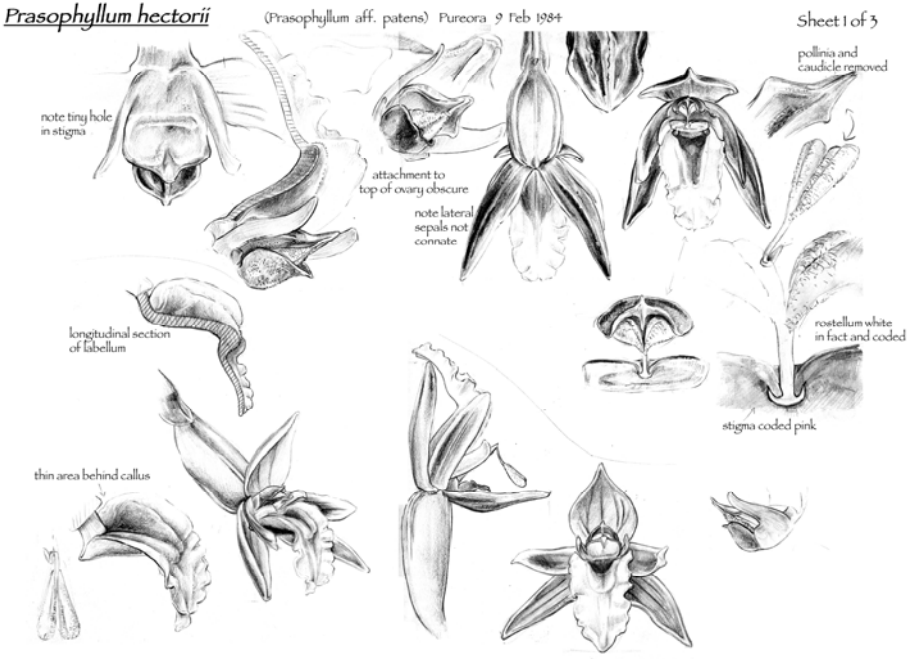
24: *Prasophyllum hectorii*

(for James Hector)

A tall plant of swamps and bogs, often growing in open water, the broad, white labellum is most conspicuous

Distribution – endemic – North Id., bogs around Mount Ruapehu and in the Waikato., Chatham Is.

Flowers – January-February – self pollinated



Eponymous orchids: Val Smith

John George Robertson 1803-1862, and *Calochilus robertsonii*

In 1941 Reverend H M R Rupp, who spent his spare time studying the orchids of Australasia, wrote in "The Victorian Naturalist" that the National Herbarium of New South Wales contained a number of orchid specimens bearing the labels "Herbarium of J G Robertson". The localities given were Wando Vale, Glenelg River, or Portland – all in south-west Victoria. *Calochilus robertsonii,* named after J G Robertson, is one of three Australian bearded orchids that also occur in New Zealand, and may well be represented in that collection. Who was Robertson?

John George Robertson was born in Glasgow in 1803, and spent two years as a botanist and naturalist with an Indian expedition before migrating to Australia in 1831. For the latter seven of the nine years he spent in Van Diemen's Land (Tasmania) he managed "Formosa", the estate of early Tasmanian botanist Robert William Lawrence. He knew Ronald Gunn, who had met Lawrence before his death in 1831, and was sending Tasmanian plant specimens to William Hooker at Kew. Encouraged by Gunn, John Robertson and other local naturalists were soon collecting for Hooker as well.

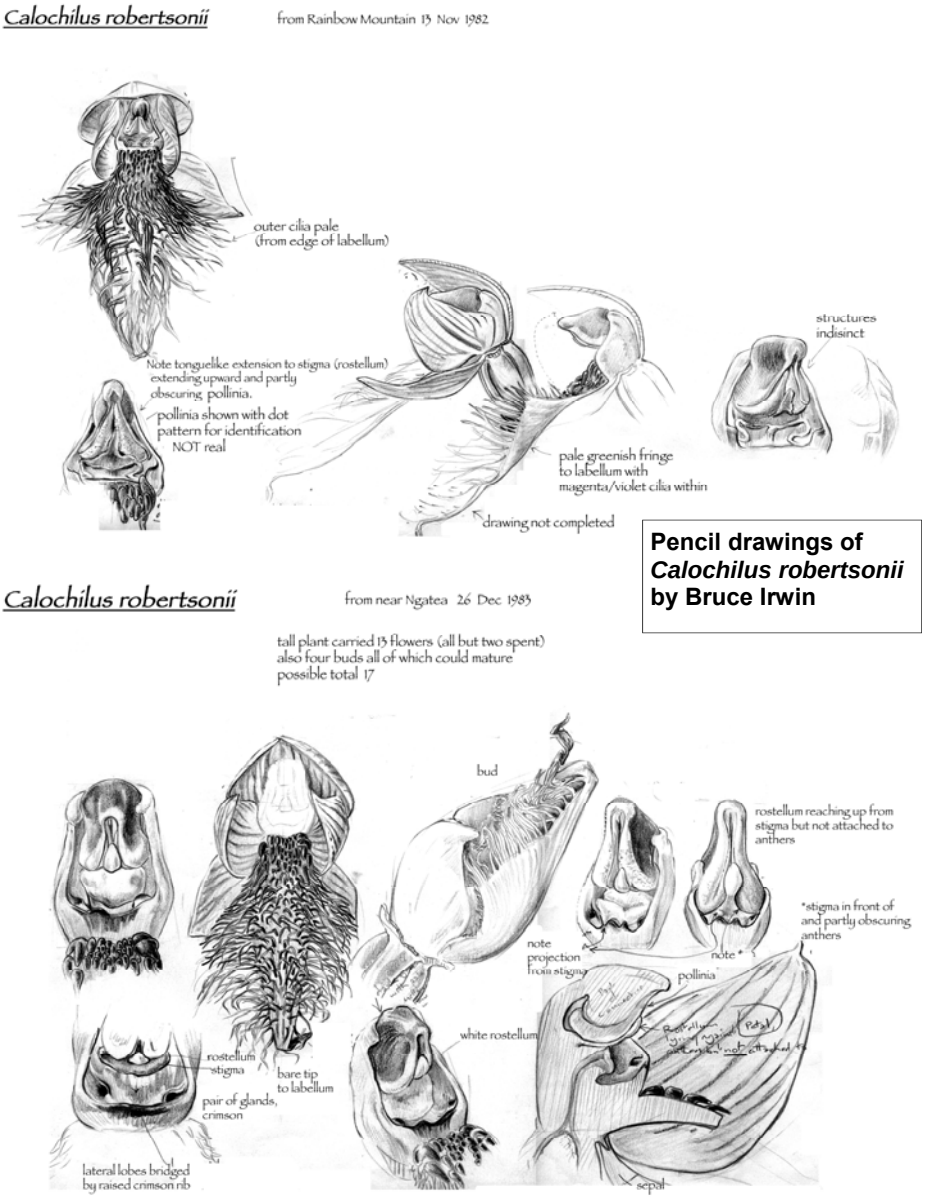
Moving to Victoria in 1840, Robertson landed at Portland Bay with a valuable consignment of stock, and took up the Wando Vale pastoral run near Casterton. On several occasions Governor Latrobe was a guest at Wando Vale, the two men having mutual botanical interests. Robertson collected extensively on his property, and also in the south-east of South Australia. He maintained regular correspondence with Gunn and other botanists, and Gunn may also have visited Wando Vale, for the labels on Robertson's specimens at Sydney are in the same handwriting as those of Gunn's own herbarium there. The development of a garden at Wando Vale was early on Robertson's agenda, and a long list of plants supplied by a Launceston nurseryman in 1846 show that Robertson was an ardent grower as well as collector of plants. He and his wife, Mary McConachie from Coleraine, had no children.

In the mid-1850s Robertson sold Wando Vale and returned to England and Scotland, where he purchased "Baronald", near Lanark. His personal collection of 4,000 Victorian specimens was given to Sir William Jackson Hooker at Kew. George Bentham had access to it while preparing his "Flora Australiensis"; he mentioned Robertson frequently, and commemorated his botanical work in the names *Calochilus robertsonii* and *Ranunculus robertsonii.* John George Robertson died at "Baronald" in 1862.

Calochilus (Gk kalos: "beautiful"; cheilos: "lip") is an Australian genus of terrestrial orchids, a few of which have spread to Papua New Guinea, New Caledonia and New Zealand. Most have hairy labella and are known as "beardies".

Calochilus robertsonii is a slender to robust orchid with a single, erect channelled leaf and up to 15 flowers on its solitary stem up to 50 cm high. The flowers have greenish red petals and sepals with prominent reddish stripes, and a hairy red beard-like labellum with a hidden short, twisted hairless ribbon at the tip. There are prominent "eyes" at the bases of the column-wings.

It prefers sunny places, often dry and bare areas under eucalyptus, or in geothermal ground, and flowers from November to December. It is common in Australia, but in New Zealand is confined to a few sites in the central North Island, where its survival is at risk.



Pencil drawings of *Calochilus robertsonii* by Bruce Irwin

Australian notes: D. McConachie

Australian *Spiranthes*

R. Bates J. NOSSA 32 (6): p52 July 2008

Spiranthes is a cosmopolitan genus of perennial, terrestrial orchids: that is they grow on the ground and have leaves which are present all year round. They are generally known as Spiral ladies' tresses, an odd common name if there ever was one.

Until about twenty years ago there was thought to be only one Australian species which was supposedly the same as plants from eastern Asia and hence was called *Spiranthes sinensis,* which translated means 'Chinese spiral flower'. Fortunately the accepted name was changed to *Spiranthes sinensis* ssp. *australis* and eventually *Spiranthes australis* ie Southern or Australian *Spiranthes*.

During a trip to the eastern states in the 1980's it became obvious to me that their little woodland species with its tiny bright flowers was not the same taxon as our South Australian swamp plants but we remained conservative and continued to call them all *S. australis.* At about the same time on NOSSA field trips we discovered a new self pollinating white flowered species in peat bogs of the Mount Lofty Ranges and this one was illustrated in the pink book *Orchids of South Australia* in 1990.

This year, 2008, and it has been a long wait, David Jones in the June *Orchadian* noted that true *Spiranthes australis* is indeed the small woodland form from the eastern states and that our South Australian plants would need a new name. Consequentially he named and described the outcrossing large pink flowered swamp species from the mountains as *Spiranthes alticola* or Mountain Spiranthes if you like.

So we have a new name for our pink flowered South Australian plants: *S. alticola* DL Jones. Our *Spiranthes* 'selfing white' is still awaiting a name, and as for our South-east swamp plants we don't know whether they are *S. alticola* or not since they grow on the coastal plain.

The Orchids South Australia CD has pictures of all three Australian Spiranthes.

Translocation of *Pterostylis cucullata*

Russell Mawson ANOS (Vic) Bull Vol.41 (3): 13-14, Sept 2008.

Pterostylis cucullata is a spring-summer flowering terrestrial orchid. In September / October 2004, I was told of a population of *P. cucullata* on private land on the Mornington Peninsula in Victoria. The owners had applied for a permit to clear trees, to allow for building their house. The shire representative inspected the site, and *P. cucullata* was found within the building area. As this is a national and state listed plant under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and the state Flora and Fauna Guarantee Act 1988, a permit for translocation from the Commonwealth Department of Environment and Heritage Canberra was required. I marked the area of approximately three square metres occupied by the main population, and estimated there were between 200 and 500 flowering plants. Almost six months elapsed before the permit arrived and there was a convenient time for the translocation to start. Since the plants were no longer visible, it was fortunate the markers were still there. The site was towards the front of the block and quite degraded. The soil was alkaline sand (pH 8.5 - 9) and easy to work.

Removing and storing the plants

We chose the last week in February to dig the plants out. The first day saw four of us working and transferring the blocks of soil into styrene boxes which had a piece of shade cloth placed across the bottom. We used garden spades to cut squares of soil the width of the blade and about 2/3 the blade depth. As the day wore on, and with the number of boxes increasing rapidly, we used our hands to sort

the tubers and, as the sand was loose and dry, they were easy to see. The boxes had 75-100mm of soil put into them, and the tubers were put onto this and covered with a further 50-75mm of soil. At the end of the day we had 34 boxes. On the second day, with three of us hand sorting, it took a bit longer and produced another 24 boxes. The boxes were taken to my home and cared for until a site within Cape Schanck National Park was selected and approved. As room to store 58 boxes was limited, I decided to hand sort, count and replant the tubers. This reduced the number of boxes to 34 containing 1875 tubers between 4mm and 20mm in diameter. Tubers under 4mm were not counted. The boxes were placed on benches in a sheltered area and covered with bird wire and 50% shadecloth. This allowed natural watering of the plants, with approximately three hand waterings required in the twelve-month time span. I had placed 48 of the larger tubers in one box and those plants were the first to emerge and flower in early June, the rest appearing according to size right through to late November. There were a large number of flowers and ten or twelve seed capsules produced by natural pollination.

Replanting

A site in the Cape Schanck National Park was chosen, taking into account vegetation, aspect and soil. The tubers were to be planted in one metre squares. Over the two days prior to the planting, all the tubers were removed from the soil in the styrene boxes and washed to remove any remaining soil. This was done to help minimise the risk of introducing pathogens into the site. We used a one metre square piece of garden mesh marked into 10cm squares. To hold the mesh in place, a peg was driven into the ground at each corner of the square and a numbered disc was attached to a corner peg. In each of the 10cm squares a tuber was planted. To limit the amount of soil disturbance, a tube was pushed into the ground to a depth of approximately 70mm and then lifted out, leaving a hole for the tubers. The plug was then pushed back into the hole. All the tools used were washed in Phytoclean® before they were taken onto the site. A few tubers had begun to shoot. If this new season's growth was likely to be damaged, the tuber was placed so the new growth was positioned at the side of the hole and the plug of soil was crumbled by hand so it fell around the tuber. We began planting on the 21st of February 2006 and 400 tubers were planted on that day. By the end of the third day 1400 tubers had been planted at the selected site. More tubers were planted approximately ten metres on the other side of the track from the first site. The plants were watered in, and we also had rain within seven to fourteen days after the replanting. The site has been looked at since and there is no sign of any major disturbance.

Monitoring

As a comparison, this site will be monitored at least once a month over the growing season, together with the other known sites in the area for a minimum of two years. Further monitoring will be planned following analysis of the first two year's results.

***Monitoring results 2006*:** of the 1400 tubers in the translocation site 1280 emerged, 306 produced flowers, and 18 seed capsules were produced. As knowledge of this orchid is limited, some tubers have been retained and potted up to learn about multiplication, flowering rate and seed viability, as well as providing a seed orchard should it be required. It is hoped this project will be successful. Time will tell. It is understood that translocating and re-establishing an orchid colony is a very high risk strategy and should only be undertaken if the orchids would have otherwise been killed. The Commonwealth Department of Environment and Heritage granted the permit for the translocation. The Natural Heritage Trust covered the cost of this translocation. The Department of Sustainability and Environment and Parks Victoria granted permits. The people involved with this project were: -Victoria Purdue (University of Melbourne), Merril Halley and Kirsty Greengrass from DSE, Victor Teoh, Kris Rowe and Sue Mahoney of Parks Victoria, Gidja Walker, Imelda Douglas and Russell Mawson (also representing the Australasian Native Orchid Society, Victorian Group).

Notes etc

While researching Colenso's letters to Kew at the Alexander Turnbull Library, I came across an interesting microfilm: in June 1885 Colenso sent a collection to JD Hooker of the plants he had described in Volumes 16 and 17 of the Transactions. The list included dried specimens of *Corysanthes hypogaea*, ×*Microtis longifolia*, ×*Caladenia variegata*, *Thelymitra purpureo-fusca* and ×*T. nemoralis*. Those marked with × he also sent in spirits, along with *Thelymitra formosa*, *Dendrobium lessonii* and *Corysanthes papillosa*. Hooker's notes, written in his day-book, are appended. He wrote

- *Earina alba, Col. = E. autumnalis, Hk,F.*
- *Microtis porrifolia, Sw. Matamau*
- *" longifolia, Col. a large form of the above in our Herbarium.*
- *Caladenia variegata, Col. = C. minor, Hk.f.*
- *Thelymitra purpureo-fusca, Col. = a vary. of T. longifolia, Forst.*
- *" nemoralis, Col. = T. longifolia, Forst.*
- *Corysanthes papillosa, Col. in fluid, not compared.*

& flowers of "Dendrobium Lessonii."

"Corysanthes hypogaea" - fluid.

- Elsewhere he noted, of *Dendrobium lessonii, "Note the longitudinal ridges of labella are 4. If D. cunninghamii have always 5 as stated this is a difference but therein I do not see as distinction.*
- *Earina flaccilobata Col. This is E. mucronata Ldl. of Kew Herb*
- *Pterostylis emarginata Col. Idd. as Pt. Banksii Br.*

Gordon Sylvester wrote, "Late in 2007 I had the chance to visit Kelly's Stream ED 50.02 with members of the Canterbury Orchid Society. I made two subsequent trips after this visit to observe several ***Pterostylis*** that had caught my eye. I did not identify them at the time but did take a series of photos. I logged them as *Pt. australis* or *banksii* cross, maybe with *Pt irsoniana.* Later reserach revealed several lists mentioning the strange *Pterostylis* in the Waimak, Bealey Basin as well as a comment about the bizare *Pt.* species at Kelly's Stream. Comparison with with Bruce Irwins drawings from the book suggested with photo dissections of the interior of the flower that it may be *Pt. irwinii*. Next summer when it arrives will see me looking at the Bealey and Waimak now."

Its hard to tell from the photograph, but it looks like the large Pterostylis (I believe unnamed) I have found at Fox Glacier, and Eric Scanlen reported from Southland. Or is it just P. banksii? – Ed.

It was good to see **Bruce Irwin honoured** in Tauranga, with a two-page spread showing his virtuosity as a botanical artist in the June issue of *creativebeat*, the journal of "creative tauranga", published by the *Bay of Plenty Times*. Thanks to Wilma Fitzgibbon for sending us a copy.

Peter Tait, who works as a natural history guide on Ulva Island (Paterson Inlet, Stewart Island) and has an interest in the local orchids, emailed (10 Aug 08), "A couple of weeks ago I found the first of the year's flowerings and am somewhat puzzled as to exactly what it is. I've attached a couple of photographs. There are several plants growing on a very damp, mossy bank and all are flowering. I've attached some photos, not particularly good I'm afraid as my camera is pretty basic. My own thoughts tend towards *Corybas rivularis* although it is flowering somewhat earlier than is suggested by Hugh Wilson and has no purple in the flower. As you can see the "legs" lie down across the single leaf. The photo **(Fig.1)** was taken when I first noticed it two weeks ago and I presume the flower had just opened." *It's a bud of* ***Nematoceras acuminatum,*** *recorded previously from Mason Bay on Stewart Island – Ed.*

Mike Lusk sent the shot **(Fig.2)** of an unusual ***Petalochilus chlorostylus*** from the Wakarara area, Hawke's Bay. He emailed again: "Attached **(Fig.3)** is a pretty *Pterostylis* I found last year. Eric suggested I send it to you with some details but I am afraid I didn't record much, and I missed the labellum. I think it would have been at the lower end of the track....What do you think? *I think it's P. cardiostigma, but its hard to tell from a photo – Ed.*

"I'd be grateful if you'd look at another **(Fig.4)** *Pterostylis* Eric and I are unsure about. I found it in Dec 06 on the track closest to Camp Wakarara. I thought it might be *P. areolata*. *I agree – Ed.*

"I was doing some classifying recently and came across the attached photo **(Fig.5)** of probably the ugliest *Pterostylis* in the land.... I found it in a shady swampy area in the headwaters of the Hurunui, in Nov 2005, close to a hut on the Hurunui High Country Walk. It was the only one of its type, but there were plenty of *P. areolata* in the area. If any readers plan to do the walk, which is easy and well catered I would be happy to advise them where to look." *It looks like a rather deformed P. areolata – Ed.*

Ewen Cameron emailed (20 Aug), "In response to Eric Scanlen's comment under *Notes etc* in your last *Journal* [J109: p. 26] about ***Anzybas rotundifolius*** **southern limit**: contrary to reporting there are specimens in AK from the Waitakeres, I can inform you that there are no specimens labelled as such from the Waitakeres in AK herbarium. We do hold 23 Arthur Mead collections from the Waitakeres, but only one of those is an orchid (*Thelymitra pulchella*). However, we do have a fairly recent collection of *A. rotundifolius* from the Waikato: Opuatia Wetlands (AK 294812, *P.J. de Lange 6604 & G.M. Crowcroft*, Jul 2000, 37° 26' S). I discussed this southern limit in an article I wrote on geographical limits in the Auckland region (*Auckland Bot. Soc. Jl 60*: 123-129, 2005), where I added a comment from Peter de Lange that the historical southern limit for this species appears to be the Manawatu, based on a *W. Colenso* collection at Kew."

Ewen wrote again, "Eric Scanlen's comment under *Notes etc* in your last *Journal* [J109: p. 26] about *Thelymitra* dispersal and that the **jet stream over the Tasman Sea** 'moves only eastwards' – this isn't true. Peter Wardle (*NZ J Botany 16*: 535-550, 1978) pointed out that easterlies flow around the northern sides of the anticyclones and when these are in the south of the Tasman Sea (Wardle 1978: fig. 1), especially in the summer and autumn, they were well-placed for anticlockwise air flow to carry ripe disseminules from New Zealand to Australia, particularly as they are associated with fine dry weather. This timing coincides with the *Thelymitra* capsules releasing their seed."

Minutes of NZ Native Orchid Group AGM 2007

held at Egmont Eco Lodge, New Plymouth 10 November 2007 at 5.30 p.m.

Present: Ian St George, Judith Tyler, Brian Tyler, Joy Wray, Ken Davies, Ernie Corbett, Clare Francis, Gary Penniall, Glyn Wren, David McConachie, Eric Scanlen, Gail Donaghy, Graeme Jane, Margaret Menzies, Bruce Irwin, Val Smith, George Fuller, Ina McLellan, Ian Reid and Wilma Fitzgibbons.

Apologies: Max Gibbs, Penny Berks, Kathy and Neville Henderson, Don Isles, and Bill Liddy.

Treasurers report was presented by Judith and moved this report be accepted. Seconded by Ian St.George. Carried. Judith explained cost of printing the journal has reduced considerably over the last year. Judith reported that fees can be reduced. Over the next year the annual subscription to be $20 to receive four journals per year. $10 for Email subscriptions only and $32 for journals sent overseas

Chairs report: Ian St.George presented his annual report and gave recognition of work done by Judith and Brian Tyler as Treasurer and book sales. Thanks to Brian also for the work done on the Bruce Irwin book. Thanks go to Ken Davies and Ernie Corbett for organising the annual event and accommodation. Ian recommended that Iwitahi be the venue for the AGM every second year and a field event the following year. Thanks were expressed to the Executive who have worked well through the year. Thanks to Eric Scanlen for his stirling work.

Election of officers

Ian St.George expressed a wish to stand down as chair
Chair Person: David McConachie: nominated by Ian St.George, seconded G Pennall, carried
Secretary: Gary Penniall nominated by Ian St.George seconded Judith Tyler carried
Treasurer Judith Tyler nominated by Ian St George seconded Clare Francis, carried
Committee Eric Scalen nominated by Ian St George seconded Graham Jane carried
Graham Jane nominated by Ian St George seconded by Eric Scanlen carried
Ian St.George nominated by Brian Tyler seconded by David McConachie, carried

Items of business

- Ian St.George proposed Journal to be published on net site either three or six months after publishing for interested parties. Six months accepted by thirteen votes to three.
- After in depth discussion site of next AGM decided as Iwitahi late 2008. Decided by majority.
- Site of 2009 AGM proposed as either Pokaka Lodge or possibly Te Kauri Lodge if possible. Chair to Contact Mr John West regarding possibility of Te Kauri Lodge.
- Working bee proposed for Iwitahi in January 2008 during *Gastrodia* aff. *sesamoides* flowering. Robbie and Sue Graham to be contacted to ascertain most convenient date
- Bruce Irwins book of drawings of New Zealand orchids sold out. DVD copies available from Brian Tyler for $20. The New Zealand Native Orchid Group's *Historical series* and records of the *Journal* also available from Brian on DVD for $20. Free copies of Dorothy Coopers book "New Zealand Native Orchids" donated by Wellington Orchid Society for anyone wanting a copy. Copy of minutes to be forwarded by G.Penniall to John West of Te Kauri Lodge as courtesy .
- No further business arose and meeting closed at 6.30 PM.
- After AGM a wonderful slide show of Australian Terrestrial Native Orchids of South Eastern and South Western Australia was presented by Mike Duncan and partner Emma. This was followed by a very nice pot luck dinner. *Gary Penniall, secretary.*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6: *Thelymitra nervosa* from the Puffer Track, Kaitoke, Wellington; photo Ian St George

Look carefully at the paper on page 28. **The Library of the Swiss Orchid Foundation at the Herbarium Jany Renz** has done an extraordinary thing. They have not only attempted to gather pictures of all the world's orchids, but have digitised a huge range of important early orchid books, as well as contemporary and historical orchid writing, and made all of this accessible free on the Internet. This will save researchers all over the world time in waiting for interloans, money in not having to buy books (and petrol and parking fines in not having to visit libraries). This kind of altruism combined with this kind of technology makes the world of ideas a fascinating place to live in.

ANNUAL GENERAL MEETING
NZ NATIVE ORCHID GROUP INC

To be held at Wakarara Lodge, Hawke's Bay on Saturday 6 December at 5.30pm

AGENDA

1.Present and apologies
2.2007 minutes and issues arising therefrom
3.Chair's report
4.Treasurer's report
5. Elections
6.General business

You must indicate your intention to attend, as we must tell the camp supervisors the numbers for catering. Please contact Ian St George before 20 November.

Oops! Eric Scanlen emailed, "In J109:34 the Column used the old 2n=38 for the chromosome count in *Caladenia* (*Petalochilus*) *minor* using the J76:10 list. Wrong, it would seem. Dawson et al, NZ Journal of Botany 2007 Vol. 45, have determined the NZ *C. minor* and a *C.* aff. *carneus* (?) to have 2n=40 count, apart from some with 2n=39 in the same slide preparation, but they counted no others in the genus. So, assuming that 2n=40 holds true for the whole *Caladenia* (*Petalochilus*) genus which is likely, any hybrids with *Stegostyla* (with 2n=48) would appear to have 2n=44 and would probably be viable. Accordingly, Mark Moorhouse's ***Stegostyla* 'minor'could be an hybrid *Caladenia* x *Stegostyla*** as he pointed out in N/L6:5, June 1983. Alternatively, *Stegostyla* 'minor' (see J109:40 Fig. 24) has some common features with *S. atradenia* and *S. lyallii* agg. Now, if some enterprising grower were to hand pollinate a cross or two, perhaps the hypotheses could be checked out in a few years time?"

Peter de Lange received a photograph of an orchid from **Great Barrier Island**, identified it as ***Anzybas rotundifolius,*** and its photographer Bret McKay emailed, "I came across a group of about 5 flowering plants and about 8 plants that had either finished flowering or had no signs of flowering when I was looking for some interesting toadstools to photograph during a hike up to Mt Hobson on Great Barrier Island about 15 years ago. I had no idea as to what type of orchid it was, but when I looked it up to try and identify it wrongly assumed that it was *Corybas ungiculatus*, and left it at that,and it is only now that I have learned that it is quite a rare orchid,and not *Corybas*. The situation where I found these plants was in regenerating kauri forest among leaf litter and mosses, in fairly low light and an area that looked as if it would be fairly damp, but not water logged most of the time of the year. I would not be able to pinpoint the exact location now…. (it) would have been late autumn to early winter." (**Fig.10** is from *Exploring the Hauraki Gulf: From Bream Head to the Coromandel* by Linda Bercusson and John Walsby: out mid-November, Craig Potton Publishing).

Gordon Sylvester emailed "**In 1864 J.D.Hooker wrote, under the authority of the Government of New Zealand, a *Handbook of the New Zealand Flora,*** 'a systematic description of the Native plants of New Zealand and the Chatham, Kermadecs, Lord Auckland's , Campbell's, and MacQuarrie's Islands.'

"The introduction is more than 35 pages, titled "Outlines of Botany". The main body of text is extensive, with the Orchid family occupying 13 pages, with 18 genera and 38 species. On reading this part I was intrigued to note the method by which Wm. Colenso determined his collections. It appears he may have had access to a copy of the book. Certainly, as intimated in our Historical Series No.1, both J.D. Hooker and Wm. Colenso were known to each other at this time.*

"One part of the outlines of Botany caught my eye as still relevant today as it was when written some 158 years ago. In Chap 4, Hooker detailed, 'the collection, preservation and determination of plants'. It was the 'determination of plants' that caught my eye.

"'§245. To assist the student in *determining* or ascertaining the name of a plant belonging to a flora, analytical tables should be prefixed to the Orders, Genera, and Species. These tables should be so constructed as to contain, under each bracket, or equally indented, two (rarely three or more) alternatives as nearly as possible contradictory or incompatible with each other, each alternative referring to another bracket, or having under it another pair of alternatives further indented. The student having a plant to determine, will first take the general table of Natural Orders, and examining his plant at each step to see which alternative agrees with it, will be led on to the Order to which it belongs; he will then compare it with the detailed character of the Order given in the text. If it agrees, he will follow the same course with the table of the genera of that Order, and again with the table of species of the genus. But in each case, if he finds that his plant does not agree with the detailed description of the genus or species to which he has thus been referred, he must revert to the beginning and carefully go through every step of the investigation before he can be satisfied. A fresh examination of his specimen, or of others of the same plant, a critical consideration of the meaning of every expression in the characters given, may lead him to detect some minute point overlooked or mistaken, and put him into the right way. Species vary within limits which it is very often difficult to express in words, and it proves often impossible, in framing these analytical tables, so to divide the genera and species, that those which come under one alternative should absolutely exclude the others. In such doubtful cases both alternatives must be tried before the student can come to the conclusion that his plant is not contained in the Flora, or that it is erroneously described.

"'§246. In those Floras where analytical tables are not given, the student is usually guided to the most important or prominent characters of each genus or species, either in a general summary prefixed to the genera of an Order or to the species of the genus, for all such genera or species: or by a special summary immediately preceding the detailed description of each genus or species. In the latter case this summary is called a *diagnosis*. Or sometimes the important characters are only indicated by italicizing them in the detailed description.'

"Hooker goes onto to detail occasional or accidental anomalies peculiar to that single one, or to a very few individuals, which may prevent the species from being at once recognised by its technical characters. He then goes on to point out a 'few' of those anomalies.

"Reading those remarks and the manner they are couched in leads me to a conclusion that collectors can either put in too much effort in determining a species, or not put in enough. Where to draw the line? The lumpers and the splitters will continue to plague the others' thought processes and keep controversy to the fore. So may it continue."

** Indeed, Colenso's 100+ letters to Kew are the subject of a book we will publish next year: Colenso started sending specimens to WJ Hooker in 1840, met JD Hooker at the Bay of Islands in 1843 and corresponded with him for the next 55 years; he received a copy of the Handbook, and criticised it sharply in a letter dated 29 November 1865 – Ed.*

The Column: Eric Scanlen

1. Orchid seed transport between Oz and NZ

It all started again, when Ian St George sent the Column that anonymous bud from a plain blue *Thelymitra* at Shag Point, Palmerston, on 30 Nov 07. Yes, it was the bud with the thrips in it and yes, the Column took it to be *Thelymitra* "bee" which you may have heard about, from Motutangi, 8 Nov 1995, Middle Rd Horopito, 1 March 1997 and Hatfields Beach, 30 Oct 1999. What "started again" was the old debate; was spotted *T. decora* a different taxon from spotless *T. nervosa*? In 2000, the Column lumped *T.* "bee" slides with *T. decora* Cheesem*,* then crossed that out and tagged them as *T.* "bee" because it was too different. Now they are relabelled *T. nervosa* because of the distinct similarity with Ian's anonymous bud — which he identified later — and with Colenso's description of *T. nervosa* in J65:28 and the Historic Series Vol. 1.

You see, the Shag Pt. spotless *T. nervosa* bud, had no warts on the dark back of the post anther lobe (p.a. lobe), it had shallow ridges instead. See **Fig. 7** so it was obviously a different taxon from spotty, warty *T. decora* (**Fig. 8**). Not so fast though! Trawling through the literature turned up some irksome exceptions — to prove the rule? as they say?

Colenso described *T. nervosa* in 1888 from some 1879 flowers given to him by a visitor from "Highlands base of Mt Ruapehu (Tongariro Range)" and he commented on the "large, dark coloured flowers, their segments much veined." The veins or nerves are notable in the Hatfields Beach flowers too but hardly prominent enough for identifying the species. Checking from photos, the spotted flower's veins are less prominent and much the same as in other species of *Thelymitra*. No doubt Colenso's specimens were dried and pressed, making veins look more prominent? His description of *T. nervosa* is important for the prominent characters that he *didn't* mention; no spots on the petals and no dark warts on the back of the white based column yet the same William made a point of describing every small detail. Dr Brian Molloy (pers. comm.) had discovered plain blue *T. nervosa* on Mt Herbert at the top of Banks Peninsula. Ian St George reported the find in J34:8, June 1990, as with more prominent tubercles on the p.a. lobe than northern forms. Ian had dark blue, spotless *T. nervosa* with warts from Shag Pt. in Dec 1986 [J23:11, 34:8,**9**] yet his 2007 bud from there, had no warts (**Fig. 7**). He also reported one plant from Shag Pt. in 1990, with a single spot on each petal and "tubercles [warts] more prominent than in northern *T. decora*". Also, at Jollies Reserve, near Hanmer [J53:15] in early Jan 1995, Ian spotted (get it?) *T. decora*, "many without spots and a few lacking tubercles on the p.a. lobe" so it would appear that either the species are very variable or that hybrid taxa occur with mixed

Neither *Thelymitra decora* nor *T. pulchella* could have originated in Australia because they are amphidiploid hybrids with NZ endemic *Thelymitra longifolia* as one parent. So progeny of *T. longifolia*, *T. decora* and *T. pulchella,* could not arise in Australia without a westwards carrier of some sort. Molloy and Dawson, in their landmark paper [3] showed that *T.* aff. *ixioides* (2n=28) crosses with *T. longifolia* (2n=26) giving *T. decora/nervosa* (2n=54). Also *T. cyanea* (2n=40) crosses with *T. longifolia* (2n=26) giving *T. pulchella* agg. (2n=66) In both cases, effectively adding the chromosome counts of the parents. Microscopic study of the pollen of all these species assisted in establishing parents and progeny. Thus *T. decora* and *T. pulchella* are as much NZ endemics as is *T. longifolia.*

characters in these widely separated sites; which tends to cloud the issue. Plants with mixed traits in one colony usually imply hybridism. Bruce Irwin's drawings sit on the fence, showing the grooved column back but no hint of either spotted or plain petals. *T. nervosa*'s top reported altitude of 840m at Banks Peninsula, is well below spotted *T. decora*'s 1,200m up the Mangatepopo Valley. Allan Ducker and the Column found only sadly mutated *T. decora* specimens here, on 18 Feb 1995, spotty and warty but otherwise seriously deformed with some lacking in essential parts. There are photos. Possibly there were non-mutated specimens earlier in the season. Colenso's *T. nervosa* type specimens were presumably from lower down the mountain. The Column's field party saw only spotted flowers, aplenty, at the Coromandel Pinnacles Hut on a hot 2 Dec 1995 [J59:20]. Most p.a. lobes had minor mutations but columns were reproductively intact. A pink one had one or two spots on both dorsal sepal and labellum as well as the usual place on the lateral petals. Photos show only warty p.a. lobes here as also at Iwitahi and the Blowhard Reserve in the Kawekas on 5 Dec 1999. On the "bee" day, 30 Oct 1999, at Hatfields Beach, [J74:13,14,**18**]. Ian, Allan Ducker and the Column puzzled over this plain blue with the attentive native bee. It had no spots so it couldn't be *T. decora*. The unspotted ones from the S. I. weren't considered either but should have been. Allan's videos from Horopito and Motutangi, later indicated that *T.* "bee" was widespread in the N. I. but after five years of it not showing again at Hatfields, it also has to be elusive. Now its clear identification with *T. nervosa* gives this species a wide distribution, at least from Motutangi to Shag Pt. but it could never be considered common. A creamy specimen, with purple spots and with warts [J83:**14**] was captured by Wolfgang Rysy, at Haurangi SFP in the Aorangis on 2 Dec 2001, during his brief visit to NZ. Notably, the spotty one has many colour variations and minor mutations whilst the plain blue stays plain blue without mutations. Note that *T. nervosa*'s anther stands erect at the back of the column as in **Fig. 9** but *T. decora*'s has the top tilted forward almost into the cluster of cilia as in **Fig. 8**.

T. nervosa/decora is undoubtedly an amphidiploid hybrid of *T.* aff. *ixioides* and *T. longifolia* [1]. Dawson et al [2] imply that both forms (only the *nervosa* epithet is employed) have 2n=54 chromosomes, the sum of 28 from *T.* aff. *ixioides* and 26 from *T. longifolia*. *T. pauciflora*, which also has 2n=26 chromosomes and a similar distribution to *T. longifolia*, doesn't come into the picture. Remember that amphidiploid hybrids such as *T. pulchella*, can amplify the variations in their parent species. However, the formal discontinuation of the title *T. decora* and substitution of *T. nervosa* has not been formally published so it is quite in order to use either or both classifications.

T.F. Cheeseman described *T. decora*, in the appendix to his 1906 Manual after stating, "I have been unable to identify…" four of Colenso's *Thelymitra* species, including *T. nervosa*. In his 1925 Manual, there is no mention of *T. nervosa*. Moore and Edgar declared *T. nervosa* as "unresolved" on p122 of the 1970 Flora, Vol. 2. Brian Molloy's interim *T.* aff. *decora*, for the unspotted, warty form, was mentioned by the Editor in J34:8. *T. nervosa*, slipped unannounced, into the Editor's Orchid List in J65:7, Dec 1997, with Colenso's original description reprinted in the same issue on p.28.

Thus spotty with warts is going into the Column's Journal index as *T. decora* Cheesem, the plain blue with shallow ridges will be *T. nervosa* Colenso and the plain blues with warts can go in as hybrids until such time as anyone scientifically proves otherwise.

Spotted *T. decora* has that Victorian lookalike, *T. simulata* [J109:24] which once confused the issue by being identified as *T. decora* but it has only 2n=52 chromosomes, not 54 so had to be renamed despite the physical similarity.

Summarising; the Column's index description of these two taxa will include the characters in the table overleaf:

	T. nervosa	*T. decora*
Tepals	dark blue	blue-pink
Spotted	no	yes
Col. base	white	purple
P.a. lobe	4 ridged	warty
Anther	erect	jutting
Mutations	none seen	frequent
To altitude	840m	1,200m
Distribution latitudes	34° 50' to 45° 29'	37° 20' to 45° 29'

References

1. Dawson, M.I. and Molloy, B.P.J. *Speciation in Thelymitra (Orchidaceae) by natural hybridism and amphidiploidy,* N.Z. Journal of Botany Vol. 36 1988, 103-112
2. Dawson, M.I. et al *Contributions to a chromosome atlas of the New Zealand flora* NZJ Bot 2007 Vol. 45: 611-684
3. Bishop, Tony *Field Guide, Orchids of New South Wales and Victoria,* 1996 UNSW Press; 28
4. Backhouse, G.N., & Jeanes, J.A., *The Orchids of Victoria,* 1995 Miegunyah Press; 337

2. *Pterostylis* "pulchragalea" (was *P.* "Blyth")

The Editor and the Column were viewing some old and faded prints from H.B. Matthews quarter plate negatives at the Auckland War Memorial Museum Library, when one figuratively leapt out as *Pterostylis* "Blyth" [J105:28,**29,32**) complete with finger-like extension to a right twisted labellum and lateral sepals curled just at the tips. Henry had photographed it at and written it up in his 1928 Ms descriptions, reprinted in Matthews and Son on Orchids, but omitted to mention those three distinguishing traits underlined. Thus the Column, who compiled that booklet before he connected his photos of the same taxon from three separate locations, decided in error that Henry was onto *P. irwinii.* Please accept the Column's apologies and do mark the correction to *P.* "pulchragalea" in J105 and your copy of Matthews and Son on Orchids.

Waimarino, incidentally, no longer exists under that name. Can any readers enlighten us as to where it used to be? The Waimarino Stream still meanders through the swamp at Erua where Bruce Irwin first spotted *P. irwinii* and continues south towards the Waimarino Forest west of Raetihi but we have not be able to determine where Henry stayed at the Waimana Boarding house in Waimarino when he wrote to Mr Petrie on 22 Dec 1921. A Waimarino River drops into Lake Taupo NE of Turangi. So Waimarino may have been on one side or the other of Whakapapa from whence Bruce Irwin drew his identical *Pterostylis* aff. *montana* "late" and the Column captured the third pic of *P.* "Blyth".

This taxon is being entered into the forthcoming Colour Field Guide as *Pterostylis* "pulchragalea".

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Colenso to Balfour

Orchid extracts from William Colenso's letters to David Balfour, who collected a number of orchids, which Colenso described as species, from Glenross, Hawkes Bay.

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The Column (Figs 7-9) pp47-49.

Fig. 7. *Thelymitra nervosa* p.a. lobe showing two of the four shallow ridges down the back; no warts and almost white column base. From Shag Pt. Palmerston, 30 Nov 2007. The *Thrips* "Thelymitra" was the original subject.

Fig. 8. *Thelymitra decora*, p.a. lobe showing dark warts on the back, not ridges. Note also the top of the jutting anther inside and purple column base. Iwitahi 2 Dec 1994.

Fig. 9. *Thelymitra nervosa* alias *T.* "bee" with native bee checking the erect anther in the back of the column. Anther position is clearer in the 3-D pair. Note white column base. Hatfields Beach, 30 Oct 1999.

Fig.10. *Anzybas rotundifolius* on Great Barrier Island. Photo Bret McKay, from *Exploring the Hauraki Gulf: From Bream Head to the Coromandel* by Linda Bercusson and John Walsby. Craig Potton Publishing: mid-November (see p.45).