

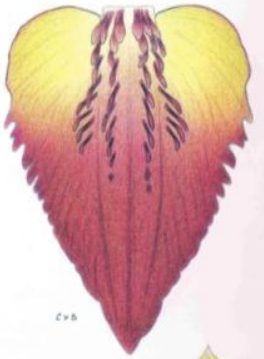


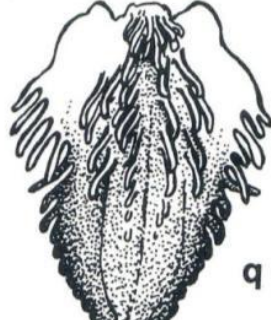


VICTORIA'S CLUBBED SPIDER CALADENIA

DISCUSSION OF MORPHOLOGICAL GRADING & SUGGESTIONS FOR THE REVISION OF THEIR TAXONOMY

Part 2 – The Montana Type *Caladenia montana* Including *Cobungra* & *Buchan Spider Orchids* Draft Version - March 2015

My Introduction explains how I categorise general spider caladenia orchid Types and particular Forms of those Types. If this Part is read without first reading the Introduction the following recaps relevant information contained in the Introduction. Otherwise this page can be skipped.

The theory I explore in this discussion is the proposition that in Victoria there are (A) 5 major, widespread, clubbed spider caladenia Types, namely: (1) Fitzgeraldii Type (2) Montana Type, (3) Australis Type¹, (4) Reticulata Type; and (5) The distinctive and relatively uniform *C. clavigera*; (B) several Types, usually of limited and/or disjunct distribution, that correspond to *C. brachyscapa*, *C. valida*, *C. ancylosia*, *C. xanthochila*, *C. aesteva*, and Turners Spider Orchid; and (C) Some places where there appear to be an, often confusing, population of different clubbed Spider Caladenia about which little is known/understood.

| Fitzgeraldii Type | Fitzgeraldii Type | Fitzgeraldii Type | Montana Type | Australis Type | Reticulata Type |
|---|--|---|---|--|--|
|  |  |  |  |  |  |
| <p>Riley's illustration of <i>C. fitzgeraldii</i> Kandos, NSW. Moderately elongated ovate to lanceolate labellum (sometimes slightly tri-lobed) Teeth in mid-section only. Sometimes small fringing teeth as shown, and sometimes with larger longer teeth usually deflected down. All approx. relative size</p> | <p>Described as <i>C. oreophila</i> but the same as <i>C. fitzgeraldii</i>, similar to <i>C. peisleyi</i>. Has a larger, elongated labellum, and a few more teeth than <i>C. peisleyi</i>. Bill Kosky Goongerah</p> | <p>In, Flora of Victoria [FoV] as <i>C. fitzgeraldii</i> A good example of <i>C. paisleyi</i>. Similar to <i>C. fitzgeraldii</i> but a smaller plant/flower with a shorter stubby ovate labellum, variable labellum shape & edge teeth generally mid-section. Typically smaller fringing teeth (usually larger than shown) & often larger longer & sometimes upright.</p> | <p>In FoV as alternate form of <i>C. fitzgeraldii</i>. A passable example of <i>C. montana</i> which has a protruding moderately tri-lobed labellum, typically more teeth than shown. Longer finger &/or similar like back teeth becoming shorter wider (incised) mid-section, none near tip.</p> | <p>FoV <i>C. australis</i> Long tri-lobed labellum. Finger /similar back teeth (typically longer than <i>C. montana</i>) descending in size, often becoming indistinct serrations to, or almost to, tip.</p> | <p>In FoV as <i>C. lowanensis</i> Short distinctly tri-lobed labellum, often with thicker calli, finger &/or similar teeth (usually chunky as shown) extending well forward. <i>C. ampla</i>, <i>C. lowanensis</i> are the same as <i>C. reticulata</i>. <i>C. calcicola</i> is the same, or similar.</p> |

The introduction explains my use of labellum shape, the (average) number, shape, and arrangement of its teeth to identify/distinguish some clubbed spider caladenia. In this discussion I use the following terms to describe the different sizes of typical plants in a population – unless indicated otherwise, measurements in centimetres: **Large:** Lateral Sepals[LS] 4-5+, Petals[P] 3-4+, Height[H] 30-45+ **Medium:** LS 3-4, P 2.5-4, H 20-35+ **Smaller:** LS 2-3, P 1.5-3, H 15-25 **Small:** LS to 2.5, P to 2, H to 20 **Tepals** are generally 2-5+mm wide but that is flower size dependant. Here I describe them in relative terms as wide, medium, thin, gradually tapering, pinched in, etc. **Clubs** might be well defined, or ambiguous. **Tepal endings and clubs** might be round, channelled, flat and/or tail like. **Teeth** numbers is a reference to **teeth pairs**.

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¹ My data on the Australis Type is based on plants in the Won Wron/Mullundung area. A description for, and the range of, the Australis Type, is dealt with in Part 3.

MY CALADENIA MONTANA TYPE = CALADENIA MONTANA

Whilst it is a little more complex, essentially *C. montana* occurs in two+ Forms:

- (a) What I refer to as the **Common Form** - medium sized plants/flowers that has light to medium more, but usually not well, defined, medium to shorter clubs; and
- (b) What I refer to as the **Large Form** - large plants/flowers that usually have relatively long, usually heavy but sometimes sparse and/or tail like round, flat, channelled, amorphous (ie; ill-defined, somewhat irregular) clubs. Some of the Large Form plants have somewhat different character sets at different locations.
- (c) + there are, many plants that grade somewhere in-between, and in some places where both the **Common** and **Large Forms** grow together, an **Intermediate Form** with the distinctive characteristics of a particular **Large Form** (such as the Cobungra Spider), but the size of the **Common Form**, is seen.

Most, but not all, *C. montana* populations contain a mixture of both Common and Large Forms, in differing proportions. Large Forms are probably in part a result of plant adaption to darker damper forests (ie; a Variety), but in some cases appear to be just robust/more vigorous plants emerging post fire, or in a good season. For that reason I here treat them as a Form although in some instances they clearly qualify as a Variety. Although the proposition has not been statistically tested, my observation is that generally there appears to be relatively more Common Form plants in dryer open woodlands, and relatively more Large Form plants in damper darker forests. Overall the Common Form is more numerous. Large Form plants like, or more or less like, the Cobungra Spider grow with Common Form plants at sites throughout *C. montana*'s range. For example, in some seasons, they comprise around 50% of all plants seen at the *C. osmera* type site near Cann River growing in different patches than patches of the Common Form. A somewhat different Large Form is seen south of Buchan – See discussion of Large Forms below.

Apart from the heavier clubbing on Large Forms, and the 100% petal clubbing at Cobungra South, there does not appear to be any direct co-relation between particular forms and other characteristics, such as calli rows, percentage of petal clubbing, teeth numbers, etc. Rather from population to population, and within, definable limits, there is a degree of random variation of those characteristics in both Forms.

G. W. Carr's Descriptopn of *C. montana*: In a Miscellaneous Paper 1991, Carr named, but did not fully describe, *Caladenia montana* intending that a full description of it would occur in the upcoming publication of Flora of Victoria. That did not occur; instead in it *C. montana* was demoted to a synonym of *C. fitzgeraldii*.

Carr's chosen specimens were insightful in that he selected plants that showed variations seen in and across populations. His type, 2 plants collected by Jim Willis in 1964, and labelled "*Caladenia reticulata* (*fitzgeraldii* form)". These from a location in the remote Buchan River wilderness at an altitude of 920m on the steep grassy slopes between Brumby Point @ 1350m, and that part of the Reedy Creek Gorge called the Chasm @ 750m. Both plants ~30cm high with typical *C. montana* labella and solid round reasonably well defined clubs. The plants pressed to show the 2 labella from different angles. One plant with a larger flower without petal clubs, has lateral sepals 4cm, petals 3cm, long. The other with petal clubs, lateral sepals 3cm petals 2.5cm. Carr's representative specimens (a) One largish poorly pressed double flowered plant collected by H. Morgan from Cobungra South. Both flowers with heavy clubbing on all tepals. As far as I can tell, it is the Large Form Montana I call the Cobungra Spider. (b) A medium to larger sized well pressed Common Form plant from the Playgrounds below Mts. Cobberas. The typical *C. montana* labellum can be clearly seen. It has lighter sepal clubs that thin out and gradually merge into the bare sepal, no petal clubs. (d) A reasonably large plant from Cann River (probably Noorinbee) with heavy flat petal clubs, and long tail like lateral sepal clubs, the upper parts sparsely covered with osmaphores.



Looking down into the Chasm NNE of Mt Nunniong

Carr's discription refers to most, but not all the characteristics that serve to distinguish *C. montana* (he omits any reference to teeth placement and the presence of petal clubs on any flowers) viz: "*with dark red indistinctly clavate sepiline osmaphores. ... very closely packed, but ...become increasingly distant, the osmaphore then merging into the narrow lamina of the sepals. The broad labellum with relatively short marginal teeth projected forward distally to form an oblique platform. The floral fragrance is of the 'burnt plastic' type.*"

MY CALADENIA MONTANA TYPE = *Caladenia montana* (includes *C. osmera*)

Caladenia montana is a medium (Height 20-35+cm Lateral Sepals 3-4 cm, Petals 2.5-4cm) to large (Height 35-45+cm, Lateral Sepals 4-4.5+cm, Petals 3-4+cm) clubbed spider caladenia. Whilst there are intermediate forms, populations can be roughly divided into two reasonably distinct Varieties or Forms, viz: (a) Medium sized more common plants with (relatively) shorter lighter clubbing; and (b) Larger plants with longer heavier (sometimes almost tail like) clubbing; which nevertheless share most distinguishing characteristics common to *C. montana*. [Many Large Form plants are clearly well evolved distinct Varieties, others merely good season, or post fire, robust/extreme plants]. Both co-exist in different proportions, in different populations. Within definable limits it is a variable orchid species with a range of characteristics forming several distinct character sets, rather than a relatively uniform species. In all its variations it is characterised by:

- A long mildly tri-lobed labellum that protrudes forward to form an oblique platform, the tip on around 70% drooping down or loosely curled under, around 30% with a tighter tip curl and platform less prominent.
- The labellum with longer finger and/or mildly simitar shaped[#] edge teeth along the back (base) edge section, transitioning to broader somewhat incised teeth mid-section, none in the tip section. The average number of teeth pairs in populations being of the order of 13.28 (-1 +1.5). ([#]more common on large plants)
- Typical hockey stick shaped calli in 4, or 6, rows most having 4 substantial centre rows and 2 short, often irregular, outer rows, and/or clusters of calli at the base.
- Colour combinations: A red labellum front with white to creamy yellow back towards the base; Tepals white/cream, often with a pink centre stripe; Sometimes flowers have an overall yellow/green, or red/pink, hue. Mild to heavy reticulate veining on upper and lower labellum, less often absent and replaced by a central pink flush underside.
- A small percentage with double flowers, more so in a good season, or after fire, and/or on larger plants.
- Tepals generally medium to narrow. Depending on flower size, lateral sepals beginning ~2-5mm wide gradually tapering usually with some degree of extra narrowing around 1/2 to 2/3^{rds} towards the tip. Except in dry seasons, most lateral sepals and petals are held out from their base (but below horizontal) rather than down, with the tips sometimes drooping down. The angle varies. On some (particularly large) plants both can be held out in an almost horizontal position.
- Around 45% of plants have petal clubs, although that varies from population to population.
- On suitable hot humid low wind days, the flowers omit a 'burnt plastic' odour. Although such conditions are rarely encountered at higher altitudes.
- Osmaphores, grape like usually held close to the tepal surface, occasionally mildly storked, dense near tip, of varying density further from tip.

Considerable variation is seen in club form, and tepal ending arrangements, viz:

- Very few with well-defined round clubs (referring to the clubs border with the rest of the tepal).
- Some clubs are reasonably well defined but the tepal/club borders irregular and/or merging.
- Most clubs are more or less amorphous with osmaphores extending along the tepal (often further along the back of the tepal) usually sparser further from the tip.
- A variety of short medium and long clubs that might have a light, medium or heavy cover of osmaphores.
- Sometimes long tail like clubs with a sparse to heavy density of osmaphores that become less dense further from the tip. These tail like tepal/club arrangements often without any noticeable tip end thickening, with narrowed parts to tip channelled and/or rolled to a round cross section, are often indistinguishable from that seen on tailed spider caladenia, save that, the shape of the osmaphores is different (round rather than hairy), and on these the cover of osmaphores (at least near the tip) is relatively dense, compared to an all over sparse cover on tailed spiders.
- Lateral sepals usually begin flat and narrow at around 1/2 to 2/3^{rds} of the way to the tip, either (a) becoming round often, with some curling in of the edges as they narrow; or (b) on some the edges roll into long round tail like clubs; on others the rest of the tepal including the clubs are (c) channelled; or (d) flat.
- Petals with or without clubs tend to be flat. Those with clubs (around 45%) may have light to heavy, very short to long, round or flattened clubs. Petals with heavier clubbing may have a pinch about 2/3rds of the way to the tip, but be flat both sides of the pinch, or they may be channelled.

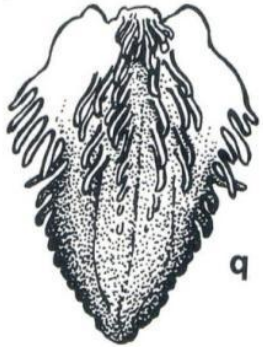
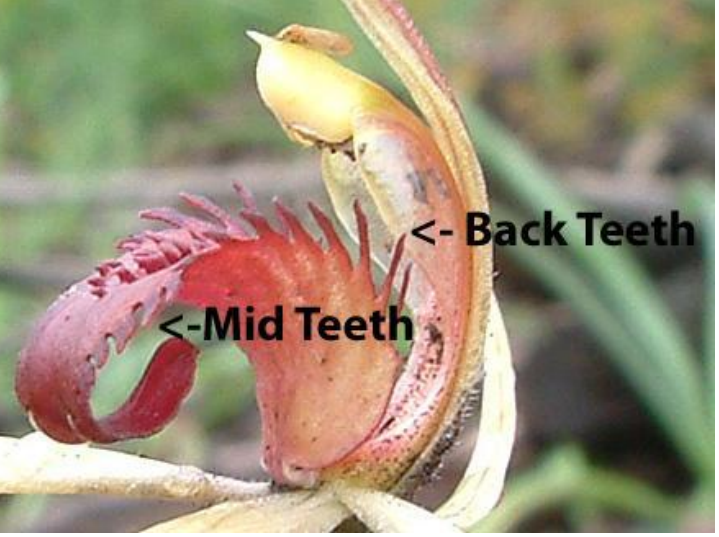


Some of the more extreme of these tepal/club arrangements, and other variable characteristics such as 6 calli rows, or more teeth, are more often seen on larger plants, and/or after fire, or a good season, and/or more so in some locations than others. (And perhaps plants tend to have longer heavier clubs in damper greener forests/habitats, lighter smaller clubs in dryer open forests/habitat). Even so, there is often no correlation between any of these variable characteristics, and plant size, habitat or location; with most populations having a (different) mix of these characteristics. – See my Montana Data Table below.

DISTRIBUTION

Caladenia Montana differs from other of our clubbed spider caladenia in having much of its extensive range intact post European settlement. It extends from altitudes of 1,500m or more in the High Country, down to 100m near the coast. Its stronghold is the Victorian High Country between Cobungra and Wulgulmerang from there extending **south** and down the Buchan River Valley to the foothills and coastal regions of East Gippsland. Its occurrence/range in most of these places is reasonably well known/documented. It is known to occur in other places such as; To the **south east** in the wider Goongerah, and probably Bendoc and Tingaringy regions and the Upper Cann River valley. To the **north** in the ACT and SE NSW; Individual plants and populations have been found to the **west** around Wonnangatta, Mt Tamboritha, Licola, and the Cathedral Ranges; but its occurrence and the extent of its range in these other places is not well known/documented.

Somewhat similar plants occur in the foothills of central Gippsland at Moondara, and north of Briagolong, to around 300m altitude, these are discussed elsewhere.

Examples of Caladenia montana's distinctive labellum [‘Teeth’ a reference to the number of paired teeth on the labellum edge and/or teeth on one side.]

| | | | |
|---|---|--|---|
|  <p>8- 9 Teeth + small bumps Usually longer, more teeth. Shows mild tri-lobe shape, how teeth begin well back on edge rise, & irregular calli clustering near base</p> |  <p><- Mid Teeth <- Back Teeth</p> <p>12-13 Teeth With mild reticulate veining # See note below</p> |  <p>13-14 Teeth A good example of similar like teeth becoming shorter broader to front. Note 4 longer rows of calli plus short outer rows at back</p> |  <p>14 Less extreme teeth. Tip curled well under. Heavier reticulate veining</p> |
|---|---|--|---|

This labellum, although more exaggerated than is typical, shows the key characteristics of C. montana labella. Labellum protruding to form an inclined platform; Long thinner finger like back teeth; Broader incised mid teeth; None closer to tip, which is lightly curled under; Some teeth with similar shaped tips.



All Cowombat, Alt 1,320m. Selected examples of mildly similar tipped/shaped teeth also showing typical calli form

CALADENIA OSMERA = CALADENIA MONTANA*

Apart from variation typical of populations throughout *C. montana*'s extensive range, there are no significant differences (apart from altitude) between populations nearer the coast in East Gippsland that have been described as *C. osmera*, and other populations of *C. montana*. The Type specimens for *C. osmera* are 2 plants; One a smaller plant without petal clubs which is a good match to the Common Form *C. montana* and a larger plant with longer heavier sepal and petal clubs, a good match for Large Form *C. montana*. Remarkably my average teeth count for 155 High Country plants was 13.34, and for 81 coastal plants 13.17. See data Table and **Endnote 2**

| MONTANA DATA TABLE | | TEETH DATA | | | | CLUB DATA | | | LABELLUM DATA | | |
|--|---------------|---------------|---------------|--------------|---------------|-------------|------------|------------------|---------------------------|------------------------------|-------------------------|
| Location + Altitude | No. of Plants | Average Teeth | Typical Range | % in Typical | Extreme Range | Petal Clubs | | | Sepal Clubs Flat sections | 6 Rows of Calli [#] | Tip droop or loose curl |
| Order: High Country West to East then Coastal | | | | | | Round | Flat | Total | | | |
| ^ Cobungra South 1 1,100m | 59 | 14.61 | 12-18 | 75% | 9-27 | 19% | 78% | 97% ⁴ | 78% | 62% | 53% |
| ^ Cobungra South 2 1,100m | 9 | 14.67 | 13-16 | 100% | 13-16 | 7% | 67% | 74% | 78% | 44% | 78% |
| Cobungra 1 2010 1,150m | 15 | 13.93 | 12-17 | 87% | 10-23 | 7% | 67% | 74% | 47% | 33% | 40% |
| Cobungra 2008-09 1,150m | 8 | 13.75 | 9-15 | 75% | 9-22 | 50% | 50% | 100% | 38% | 69% | 88% |
| Anglers Rest North 1,150 | 5 | 15.00 | 14-18 | 80% | 11-18 | 100% | 0% | 100% | 0% | 60% | 40% |
| Knocker Site - Burnside 1,260m | 16 | 14.63 | 11-17 | 88% | 11-21 | 25% | 13% | 38% | 6% | 93% | 63% |
| * Knocker Site - Upper 1,000m | 14 | 13.29 | 11-16 | 86% | 8-17 | 29% | 21% | 50% | 14% | 57% | 71% |
| # Limestone Ridge 1,060m | 14 | 14.64 | 11-16 | 93% | 11-26 | 21% | 0% | 21% | 0% | 57% | 79% |
| # Cowombat Site Y 1,320m | 3 | 13.33 | 12-14 | 100% | 12-14 | 0% | 33% | 33% | 0% | 33% | 100% |
| # Cowombat Site T 1,320m | 15 | 12.73 | 11-16 | 100% | 11-16 | 20% | 13% | 33% | 0% | 22% | 100% |
| # Cowombat Site C 1,320m | 28 | 13.04 | 10-16 | 82% | 5-20 | 18% | 14% | 32% | 0% | 56% | 82% |
| # Cowombat Site WW 1,320m | 11 | 12.91 | 13-15 | 73% | 8-15 | 36% | 27% | 63% | 0% | 57% | 64% |
| # Cowombat East Late 1,320m | 11 | 12.73 | 8-10 | 100% | 36 | 0% | 18% | 18% | 0% | 75% | 45% |
| Wulgulmerang 1,000m | 15 | 11.93 | 8-15 | 100% | 8-15 | 20% | 0% | 20% | 0% | 57% | 60% |
| Total High Country (No Cobungra Sth) | 155 | 13.34 | 10-16 | 85% | 5-26 | 23% | 20% | 43% | 8% | 57% | 70% |
| All Coast Sites (C.osmera) 100-300m | 81 | 13.17 | 10-16 | 91% | 7-22 | 23% | 17% | 40% | 9% | na | 75% |
| Total All ^ Cobungra South Sites excluded | 168 | 13.28 | 10-16 | 87% | 5-26 | 23% | 19% | 42% | 13% | 50%² | 74% |
| Total All ^ Cobungra South Sites included | 236 | 13.58 | 10-16 | 83% | 5-27 | 19% | 31% | 50% | 26% | 57%² | 69% |
| Mt Tamboritha 1,200-1,260m | 17 | 12.59 | 10-13 | 77% | 10-17 | 12% | 0% | 12% | | 53% | 62% |
| Goongerah 280-300m | 21 | 13.24 | 12-16 | 75% | 10-16 | 45% | 14% | 59% | | 47% | 67% |

⁴NB: Cobungra South sites have an average teeth count higher than most (but not all sites). At 68 plants they are over represented in the total sample.

Mt Tamboritha 1,200-1,260m

Goongerah 280-300m

#: Most with 6 rows often had short irregular outer rows and/or a cluster of calli near the base.

Examples

On the following pages are plants at a range of my study sites in some cases noting Average Teeth Count [ATC], Typical Teeth Range [TTR] and Altitude[Alt.] for particular populations. Unless otherwise noted they are all Common Form medium sized *C. montana*. Some 45% of the High Country *C. montana* have petal clubs, 50% of which are round, and 50% had a degree of flattening/channelling. By comparison 99% of the Cobungra Spider Form at Cobungra South had petal clubs of which 80% had some flattening/channelling.



Wulgulmerang 4 Nov 10 Alt.1,000m ATC 11.93 TTR 8-15
Usually early, often frost affected (note petal end). This may account for its low teeth count. Note faint red veining



Cowombat -T 30 Nov 10 Alt 1,320m
All Cowombat ATC 12.91 TTR 10-16
Part of a huge and varied population



Knocker- U 5 Nov 10 Alt. 1,000m ATC 13.29 TTR 10-16
Showing glossy red labellum



Knocker-B, 7 Dec 10 [A1,260m] ATC 14.63 TTR 11-17
High teeth Count. 93% had 6 rows of calli like this flower. Note variations between this site which is 260m higher than Knocker-U = later flowering time.



Cobungra Forrest, 13 Nov 08 [Alt,200m ATC 13.93 TTR 10-12. This plant intermediate between the Common & Large (Cobungra Spider) forms which both grow here.



After the variation apparent at these other sites at Cobungra South, it's like looking at clones!
21 Nov 11 Alt,100m ATC 14.67 TTR 13-16



Left: Medium sized Common Form, Mt Stewart, Buchan River Valley between the Coast and High Country [26 Oct 11- Alt. 700m] with 13 labellum teeth pairs, faint red veining, clubbed petals, reasonably, but not, well, defined, medium length, moderately dense, sepal clubs



Right & Both Below: Large double plant Limestone post fire [6 Dec 03 - Alt. ~1,000m] showing variation in flowers see enlargements below



On the top flower: Shorter reasonably, but not well, defined, medium length, moderately dense lateral sepal club. Note channelling above its clubs [Both tilted]



On the bottom flower: Longer, rolled, almost tail like, sepal clubs with a light cover of osmaphores.

Goongerah Alt. 250-350m ATC 13.24 TTR 12-16

Mt Tamboritha Alt. 1,200m ATC 12.59 TTR 12-16

Noorinbee (C. osmera) sites Alt. 230-300m ATC 13.19 TTR 11-16

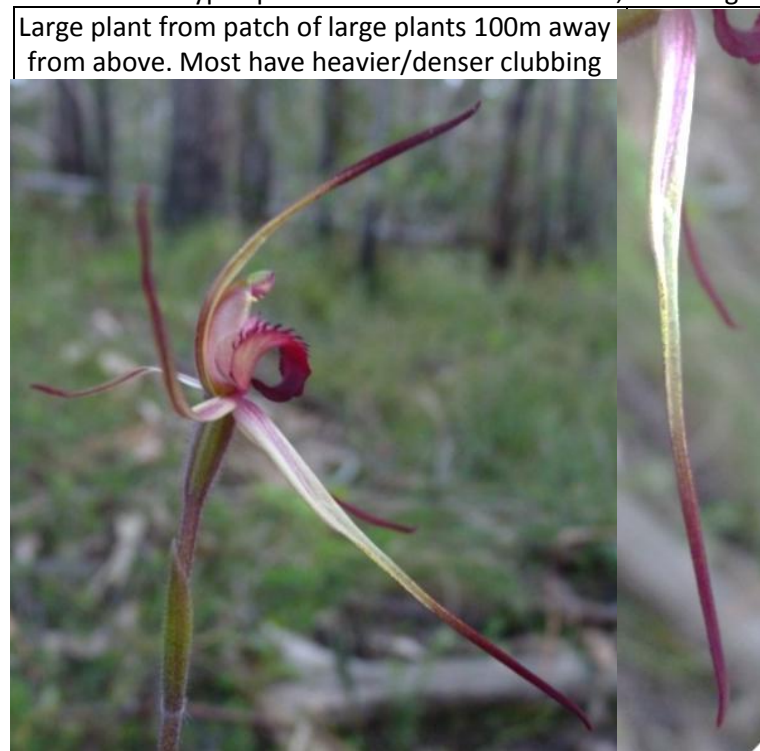


Post fire with perhaps more extreme clubbing

Generally fewer larger well spaced teeth here
Ditto Wonangatta Mel 578988

Medium sized plant from same patch of Common Form plants
as C. osmera Type Specimen. Here ~50% Medium, 50% Large

Large plant from patch of large plants 100m away
from above. Most have heavier/denser clubbing



*NB: Variation in clubbing (& osmaphore density)
of all these; Some with long tail like tepals.*

Colours (Note the presence or absence of red veining on all my photos)



Burgundy/Cream. Most common. Often has pink centre stripe down tepal



Red hue. Often seen.



*Apple green/red
Less common (there is also a somewhat similar green hue)*



All yellow (or green). Rare

CALADENIA MONTANA HYBRIDS

My experience is that most of the potential **C. montana x C. clavigera hybrids** I saw post 2003 High Country fires, were either extreme forms of *C. clavigera* with prominent labellum edge teeth, or short stocky *C. montana* with reduced edge teeth. That such hybrids do exist, but are rare.

C. montana x C. aestiva hybrids. At Cobungra South the later flowering season of the Cobungra spider form of *C. montana* overlaps with the flowering of *C. aestiva* and beautiful hybrids between them are often seen. See photo Right ->

As discussed, there is a degree of morphological overlap between **C. peisleyi** and **C. montana** (AKA *C. osmera*) where both occur. But there are not many places where that happens, and only a few I have seen post fire. With one exception, the Buchan Spider, I have not encountered any apparent **C. peisleyi x C. montana** hybrids with the usual odd/weird/grotesque features usually associated with hybrid spider orchids, particularly post fire often with, odd or blotchy colour forms, large often very pointy oversized labella that don't curl under, oddly held and/or shorter tepals, stumpy and/or scattered calli, etc.

C. montana and **C. fitzgeraldii** (AKA *C. oreophila*) co-exist near at Goongerah, in SE NSW and probably the ACT but I have not seen any hybrids. Some plants that may be these hybrids are persistently seen growing with **C. montana** and what I think is probably **C. fitzgeraldii** in the Knocker Ranges. Some have attributed similar plants as **C. montana x C. fillamantosa** hybrids.

At Noorinbee there are some patches of **C. montana** (AKA *C. osmera*) that show some signs of a possible infusion of **C. ancyllosa** characteristics from a less recent crossing event.



DISTRIBUTION OF LARGE FORMS OF CALADENIA MONTANA

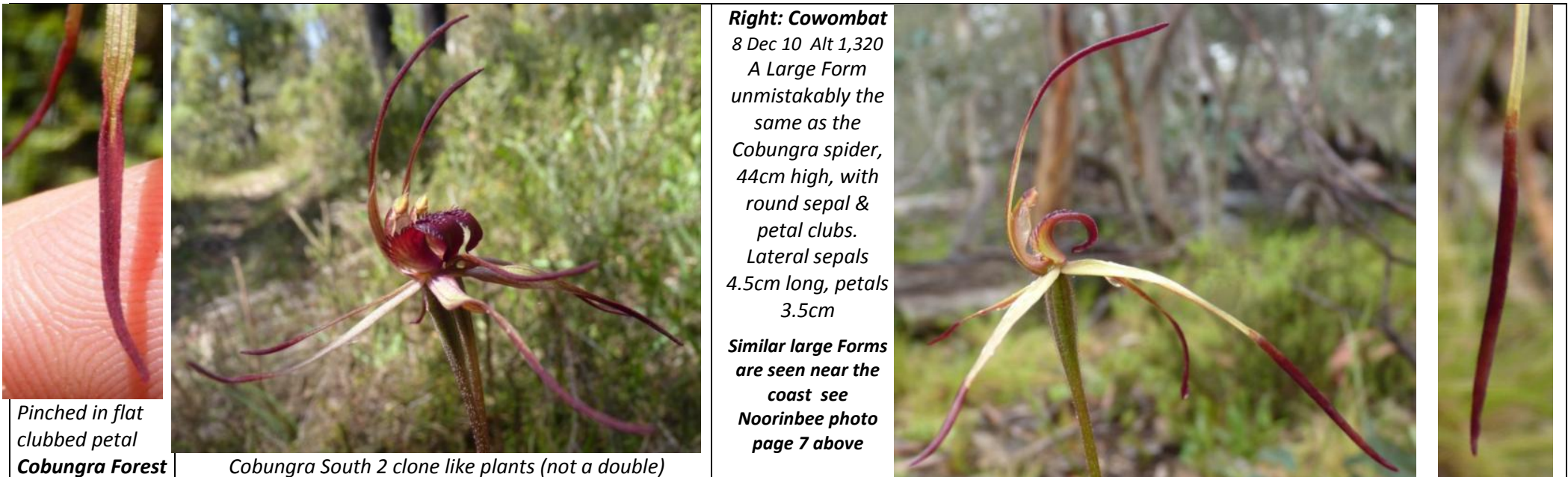
THE COBUNGRA SPIDER ORCHID AND OTHER POPULATIONS OF THE LARGE VARIETY/FORM OF CALADENIA MONTANA

My data on the occurrence of Large Forms in my study populations is incomplete. The following is drawn from my data, my recollections and photos. It is intended to give a general picture of the occurrence and mix of the Large and Common Form plants seen throughout *C. montana*'s range.

- Large Form *C. montana* co-exist with Common Form plants growing together and in separate patches at **Cobungra** (as distinct from Cobungra South) with Intermediate Form plants with the distinct characteristics of the Cobungra Spider, but the medium size of the Common Form.
- **North of Anglers Rest** plants with the characteristics of both Large and Common are seen although I do not recall seeing very large plants. The population here did not reappear until many years after the (very hot here) 2003 fire.
- Large Form plants are rarely seen dryer parts of the **Knocker Mountains along the Knocker Track** but for many years were seen in the slightly damper shadier parts/aspects of the **Burnside Track** in areas opened up by the 2003 bushfires. These days these sites are overgrown, and only Common Form plants are seen at other places along this track.
- At **Limestone Forrest** many extreme forms were seen post the 2003 fire, some of these Large Form. It is now overgrown and *C. montana* are rarely seen these days.
- At my **Limestone Ridge** site and at my **Cowombat site in the Cobberas** perhaps about 10-20% of plants are either the Large or smaller Intermediate Forms.
- Further east at a dryer **Wulgulmerang** site the Common Form here are early flowering. I don't have any record, and don't recall seeing any Large Form plants here.
- At the dryer and earlier flowering **Mt Tamboritha** site all the plants seen were Common Form.
- The populations seen near **Goongerah** post fire contained many, usually somewhat smaller, Large (or Intermediate?) Forms.
- At the various **Noorinbee** sites in all, over several years, around 30% of plants were the Large Form, but that varied from site to site, and depends on what is flowering where, from season to season. And it is much the same at other **near coastal East Gippsland sites**.

Generally Large Form plants tend to have more teeth and petal clubs than Common Form although that varies from population to population, with some populations of Common Forms with, on average, more teeth, or petal clubbing, than the Large Forms.

The following photos and commentary describe these Large Form plants and populations:



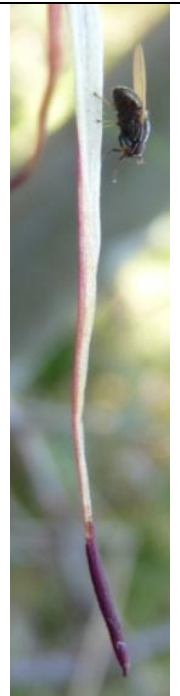
All Cobungra Spider,
Cobungra South Alt. 1,100m



Double 49 cm tall



Typical **Cobungra Spider** posture. Heavy, 5+cm long, almost tail like sepal clubs with channelled mid- sections with a slight pinch above Petals 4.5cm -see enlargement Right .



Compare to
Common Form
Cowombat
31 Dec10



Two flowers (not a double) with a typical *C. montana* platform labellum & teeth arrangement. 6 rows of calli. Light apple red/green with feint red veining.



Flowers aren't as big & don't hold their posture in dry years

All Cobungra Spider, *Cobungra South* except the tailed spider sepals bottom right. The photos previous page has tepals with a dense cover of osmaphores. These examples have a sparser cover and the absence of any distinct tepal end swelling.



A double, both with long tail like tepals
 Enlargements **Right above:** Lateral sepal **Right below:** Petal
 [Measurements are in centimeters]
Far Right Below: Two tailed spider caladenia. *C. fulva* (top)
C. fragrantissima (bottom), showing similar channelled
 lateral sepal structure, but note hairy osmaphores.
 See my note re clubbed and tailed spiders in my Introduction



Measurements CM



Examples tilted



Channelled. Osmaphores becoming sparse & extending up the back

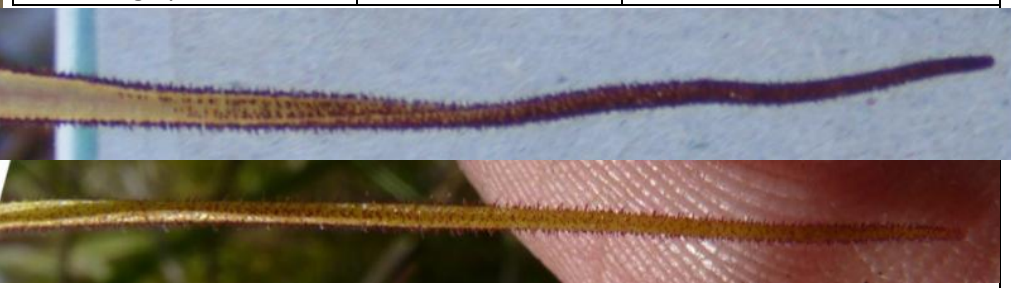


Short



Sparse with bare tips (ie; no osmaphores)

Other Examples



The Cobungra Spider Orchid

The Cobungra Spider Orchid² seen at Cobungra South is more or less like all the large form *C. montana* plants seen elsewhere in the High Country, and near the Coast, but there are some very interesting differences in this population, viz:

- It is a pure population of (only) Large Form plants growing in an isolated creek valley south of Cobungra.
- 99% of all plants in this population have long, usually quite heavy petal clubs in addition long, usually quite heavy sepal clubs,,
- Usually in populations of *C. montana* there are considerable minor variations in the general appearance of flowers, such as different colours, size, tepal posture, clubbing arrangement, and from a short distance one is conscious of looking a mix of flowers that are all a bit different. By comparison at Cobrungra South, whilst there is variation in finer detail such as teeth numbers, calli rows and height, from 1 metre or more away all plants look the same. It's like looking at clones.
- The Cobungra Form appears to have a later flowering season than Common Form *C. montana* at this altitude³.

The Cobungra Spider - Conclusion

The Cobungra Spider Orchid is a larger plant Variety of *C. montana* that is seen in a pure population of that variety at Cobungra South. Elsewhere this variety (or similar large varieties) are seen growing with smaller more common or typical forms of *C. montana*, and often with plants intermediate between them. In addition, in good seasons, or post fire, most populations of *C. montana* will produce larger more robust plants with heavier tepal clubbing, and the general appearance of this Variety, but in other season not do so.

The clone like appearance of plants in this Cobungra South population, and the fact that unlike other populations of this Variety, 99% of plants here have petal clubs, is, I think, due to there being a limited gene pool, probably derived from just a few Large Form variety plants moving into (or remaining in) this isolated valley, and being the source of the now limited gene pool of this population.

So with the Cobungra Spider Orchid at Cobrungra South we have a very good example of how a Variety of a widespread and genetically diverse species may, in an isolated place such as this, evolve into something more uniform, and slightly different.

² At Cobungra South Cobungra Spider Large Form plants are generally 33-40 cm high (some to 50cm), with lateral sepals 3.5-4.5 cm long, (some to 6 cm), petals 3.5-4+ cm compared to the Common Form *C. montana* generally 35cm high, lateral sepals 3.5cm petals 2.5-3cm. Between 2008-11 I have photographed over 100 plants growing there. Every flower usually had heavy clubs on all sepals and all, except for one magnificent double some 48cm high, had, usually heavy petal clubs. Of those counted, 78% had flat or channelled lateral sepal mid sections, and 78% somewhat flattened petal clubs. 52% had a drooping, or lightly curled under, labellum tip. 62% had 6 rows of calli, (38% 4 rows) and 86% had marginally longer back finger teeth. The relevant teeth data for the Cobungra Spider Large Form population at Cobungra South is, Average Teeth Count 14.61, Teeth Range 10-17, Extreme Range 9-27. As the Table on page 4 shows these counts are more or less consistent with all of my other populations albeit sitting at the higher end of range with 3 other predominantly Common Form populations. That is, my Anglers Rest North, Burnside (Knocker Mts.) and Limestone Ridge sites.

³ The flowering time of the Cobungra Form at Cobungra (altitude ~1,100m) is mid-November to mid-December. At Cobungra South this overlaps with the flowering of *C. aestiva* and hybrids between them occur. At the dryer more open Wugulmerang site (altitude ~1,000m) the (Common Form) *C. montana* flower early and are usually finished (or finishing) when *C. aestiva* flowers, and I have yet to encounter hybrids. (*C. aestiva* flowers here at the same time as at Cobungra South). However I don't think this is particularly significant. That for various reasons there is variation in flowering times of populations, and that in this case it is, at least in part, due to a cooler damper habitat, and fewer pollination events, at the Cobungra South site.

The Buchan Spider – A Rather Odd Fish

Prior to spring 2011 there were a scattering of small bush fires south of Buchan including at the Bete Belong and Kenny sites I refer to here, which resulted in small numbers of post fire spider caladenia emerging. The Bete Belong site [Alt. 200m] is actually about 10km NE of Bete Belong proper and roughly 10km SE of Buchan. The Kenny site [Alt. 300m] is about 20 due west of the Bete Belong site, and 14km SW of Buchan. I note a specimen at RBGM [Mel 2119231] collected by A. McDonald Snr. at Granite Rock (near Clifton Creek) NW of Bairnsdale, 35km WSW of the Kenny site, is a good match for the Buchan Spider photos below. The occurrence of the *C. montana* like Buchan Spider Orchid at these 3 dispersed sites south of Buchan is an indicator that there should be more present in the region, but probably these are only likely to be seen post fire.

It is worth noting what was seen at the Kenny site. I first encountered a patch of *C. peisleyi*, some very small, which is often the case after fire. Some distance away a small patch of hybrids, and, near to them, a patch of 7 very large spider caladenia. By their features and location the hybrids were clearly hybrids between the *C. peisleyi* and the large spider caladenias nearby. I have never seen elsewhere obvious hybrids between *C. peisleyi* and *C. montana*. However there are not many known places they grow together, and none of those have been subject to recent fire.

| Average Teeth Pair Counts Various Populations | Plants | Average |
|--|------------|--------------|
| Buchan Spider | | |
| Kenny's | 7 | 16.29 |
| Bete Belong | 3 | 12.67 |
| Kenny's + Bete Belong | 10 | 15.20 |
| C. montana high readings | | |
| Cobungra South | 59 | 14.67 |
| Anglers Rest Nth | 5 | 15.00 |
| Burnside | 16 | 14.63 |
| Limestone | 14 | 14.64 |
| Genoa (Highest Coast) | 8 | 14.30 |
| All Coastal C. montana | 168 | 13.28 |
| All C. montana | 81 | 13.17 |

Note the very high teeth count at Kenny's compared to all the other *C. montana* sites; and the low count at Bete Belong, but bear in mind these are low numbers and the results can be skewed by one or two extreme plants.



A small *C. peisleyi* at Kennys



One of the hybrids - Kennys

Examples

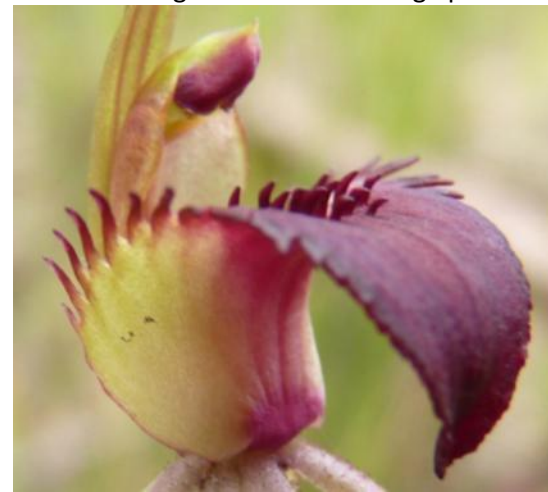
The large plants seen at both Kenny's and Bete Belong, compared to other *C. montana*, are decidedly odd, even though all their characteristics can more or less be found in other populations of *C. montana*. The photos on the following pages show the various characteristics of the Buchan Spider Orchid.



Kenny's Forrest **Plant 4** A Big Bugger



K5 ~ 14 teeth
K6 in background. Both are large plants



K6 ~18 teeth



All Kenny's



K2 ~ 16 teeth



K4 the big bugger
With ~ 14 teeth
When measured flat
would be 10cm tip to
toe and lateral sepal
5.5cm

K4 Lateral sepal tip

K4 Petal tip



Very typical *C. montana* labellum



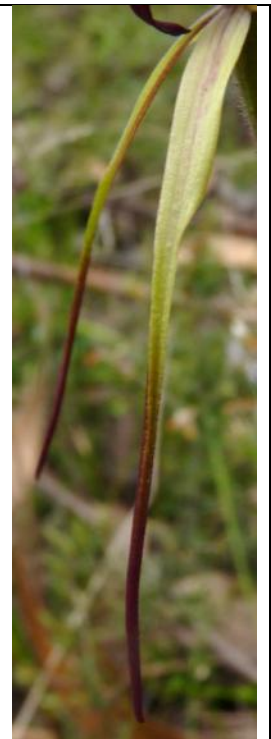
K7 JT ~17 teeth



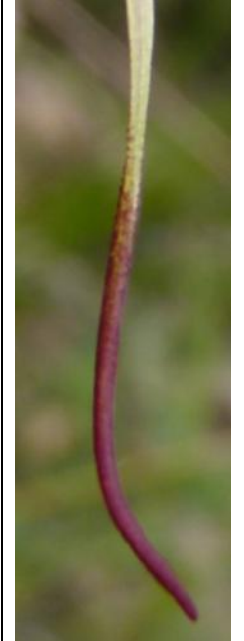
K1 5 Oct 11 ~15 teeth & Red anther



K3 & Right ~20 teeth & Red anther



K3 Lateral sepal



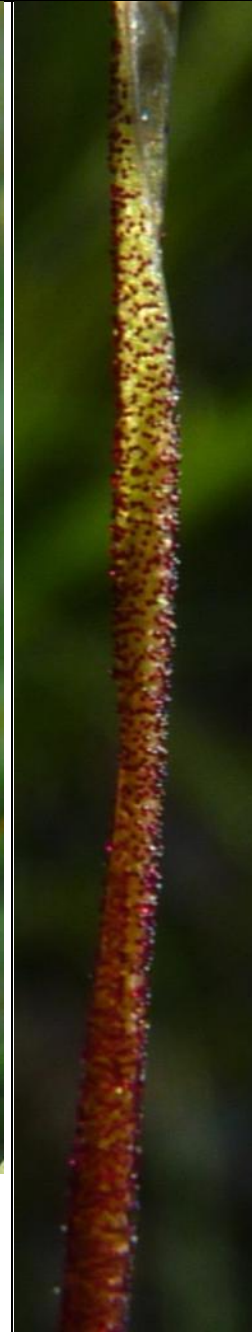
K3 Petal end tilted



B1 JT



B1 JT
12 teeth
Lateral sepals 5+cm long
Petals 3.8 cm
Leaf 10cm
Height 39cm



B1 BK same flower
later & drying out



B2 JT 12 Teeth



B3 JT 14+ Teeth

The leaf of Buchan Spider is the same as for other Gippsland Clubbed spider Caladenia eg: *C. montana*, *C. peisleyi*, *C. fitzgeraldi*, etc.)



The most relevant observed characteristics, of my (small) sample of 10 Buchan Spider plants viz a viz my sample populations of *C. montana*, are:

Variable or Clone like: There is moderate variation in both the finer characteristics and in the general appearance of these flowers from 1+m away, and in that regard they are much like most populations of *C. montana*, and, their plants do not have the clone-like appearance of the population at Cobungra South.

Teeth Number: Kenny's records an average teeth (pair) count of 16.29. That is 9% higher than the next highest *C. montana* site (15) and some 23% higher than the average of all my *C. montana* including coastal (13.28). Even so, the Bete Belong average is only 12.67. As mentioned it is a small sample of (usually more extreme) post fire plants and 5 of my *C. montana* sites record extreme plants with 22 or more teeth, the highest number of teeth recorded being 27. Significantly the highest number of teeth at Kenny's was plant K3 with 20.

Teeth Shape/Teeth Arrangement/Labellum Form: The overall labellum configuration these Buchan Spider plants, is typical of *C. montana*, save that the configuration is scaled up and exaggerated, with larger, labella and larger and usually more, rather distinctive well-spaced (less crowded) teeth. There is high percentage of large labella with unusually long narrower back teeth (80% of plants at Kenny's ; 1 in 3 at Bete Belong) and wider chunkier mid teeth (43% at Kenny's; 1 in 3 at Bete Belong). This exaggerated configuration is unusual, but not unknown, in some *C. montana* populations, particularly post fire, but even then, it is not the norm.

Tepals/Tepal Posture: A striking feature of all 10 plants is their large flowers with very long tail like tepals (particularly lateral sepals), the upper parts lightly to sparsely covered with osmaphores, 9 of which had their lateral sepals drooping down, tail like, down rather than held out. These lateral sepals 4-5-5cm long. Of the 10 plants, 2 had light more distinctly defined and slightly thickened lateral sepal clubs and 8 long curled in round, rather amorphous, tepal ends. The tip section with a denser cover of round grape like osmaphores held close to the tepal surface usually without any, or with minimal, apparent sepal end thickening/clubbing, or channelling. Sometimes some flattening is evident. The osmaphores extending well up the sepal, becoming sparse and gradually merging with the bare parts of the sepal at or above the sepal constriction, and usually extending further up the back of the sepal than the front. (See photos of both above.)

Whilst long tail like sepals like these are sometimes seen in *C. montana* populations, in most cases this structure is usually associated with some, often thick, tepal end thickening and/or a heavier cover of opmaphores extending well up the sepals, rather than in this case a generally a sparser cover of osmaphores and narrow round tepal endings. However a few *C. montana* plants elsewhere have similar sparsely covered round, non-thickened, tepal endings like these. Some Large Form plants at Cobungra South, Cowombat, Noorinbee and elsewhere do have large flowers with lateral sepals in the 4-5cm range (rarely 5+cm), but the lateral sepals and petals on the vast majority of these are held out from the flower centre.

Petal Clubbing: Like the population at Cobungra South all 10 Buchan Spider plants have petal clubs compared to ~ 40% of my total *C. montana* sample. Petals somewhat similar to tepals but usually a shorter better defined cluster of osmaphores, with little to moderate petal end thickening/clubbing.

Buchan Spider Conclusion

The distinctive features of the Buchan Spider Orchid are the large, to very large, flowers with long narrow tail like tepals held down, rather than out, and which have a light to sparse cover of osmaphores; clubbed petals; and, usually a large labellum with larger more numerous well-spaced labellum teeth, particularly long thin back teeth. These large plants, of striking appearance, and easily recognised as this particular form. Their occurrence at 3 widely separated locations south of Buchan is evidence of a wider population in these parts. The absence of clone like plants is some evidence of a reasonably rich gene pool. Ergo, they are not just a localised/isolated occurrence of freak plants. Whilst all their individual characteristics can be found in other populations of *C. montana*, albeit some not so often, the particular character set consistently seen in these plants is unique. Unlike the Cobungra Spider where similar character sets are seen in many diverse populations of *C. montana*, I have never seen any plants quite the same as the Buchan Spider in any populations of *C. montana*.

How is the Buchan Spider is to be treated taxonomically? Does its unique arrangement of characteristics, albeit characteristics randomly found in populations of *C. montana*, place it as a separate species, or a sub-species of *C. montana*? Or as merely an unusual variety, or occurrence, of *C. montana* at one extreme of its range? I prefer to deal with plant populations of at least 20 plants, preferably close to 100. I don't think it is prudent to attempt to answer these questions, until more (similar plants) are found, and the occurrence and essential characteristics of the wider population, that most certainly exists, south of Buchan, is better understood. I expect there may be some populations of the Buchan Spider that persist in open areas, but in the absence of finding these, it is probably a matter of conducting searches post any fires south of Buchan.

What can be said of it now, is that it is either, a form, variety, or sub-species of *C. montana*, or a closely related species, evolved from *C. montana*, or a common parent. That it is a very good example of how species of spider caladenia evolve over distance and time.

Range of *Caladenia montana* - Range Variation, Extreme of Range Variation

With *C. reticulata* there appears to be a gradual change in the mix/character of its essential characteristics as one moves across a reasonably flat plain with a slowly changing climate from Adelaide to Melbourne. *C. montana*'s stronghold is the alps, mountains and coastal foothills of East Gippsland, extending north into SE NSW and the ACT. In this part of its range are a mix of, topography, micro climates and forest/woodland habitats. Apart from some variation in the mix of common and large form plants (less of the latter in dryer places) and the random population variations described in the table and elsewhere, there is no discernible range change or trends. Specimens from SW NSW and the ACT are much the same as the Victorian High Country populations. Notably the morphology of populations near the Far East Gippsland coast closely matches those in the High Country. Within these parts any notable range change relates to small isolated populations probably with limited gene pools, such as at Cobungra South. Not a lot is known of populations in the western part of *C. montana*'s, range, nor how far west that range extends, viz:

And in the western parts of its range we may be seeing a degree of range variation. (That might be attributable to the isolation of these populations at the extreme of its range?) The (known) **near coastal and coastal foothill occurrence of *C. montana* (AKA *C. osmera*) west of Cann River** is rare and disjunct. Moving west from Cann River:

- A specimen from **Combienbar**. A classical large *C. montana* [MEL 1513098].
- At one small site near **Mount Raymond** (20km east of Orbost) I only record 2 slightly odd plants that nevertheless match odd plants in other *C. montana* populations. (Photo right).

Further west in the foothills

- **South of Buchan** with an apparent more westerly occurrence at Granite Rock (near Clifton Creek NW of Bairnsdale) a more significant range change with the unusual Buchan Spider Orchid (See Buchan Spider above).
- Then **North of Briagolong** Turners Spider Orchid which I regard as a separate species most closely related to *C. montana*, which is, as far as we know, confined to the Freestone Creek catchment. Reports of *C. montana* (& *C. osmera*) from Freestone Creek (incl. Cobbannah) are probably of Turners Spider Orchid. See my Discussion Part 3.
- Further west our knowledge of Clubbed Spider Caladenia in the foothills is patchy with the *C. australis* like Moondarra Spider (*Caladenia* "Southern Slopes") north of Moe the next clubbed spider occurrence I know of.



At lower altitudes, Lakes Entrance west into the South/Central Gippsland Plains.

- In the **Colquhoun Forest** north of Lakes Entrance over many years, just a few rather distinctive medium sized plants like those in the photos (right). All have (relative to most *C. montana*) exaggerated labellum teeth. That is, larger rather distinctive well-spaced teeth, much like the larger Buchan Spider (although in this case extending a little further forward, a bit like *C. australis*). These same features are seen in Canberra specimens CBG 9610268.1 and Floral Card S3639, in all 4 plants collected by Ruth Clark at the same general location on 6 Oct 1992. This is the most westerly record I have of *C. montana* at these lower altitudes.
- Further west in the **Moormurng Flora Reserve** between Bairnsdale and Stratford we see the beginning of the remnants of what must have been, pre European Settlement, a vast population of *Caladenia australis* growing in habitat that has been extensively cleared to become some of the best pasture land in Victoria.



Same plant (James Turner)

Moving west in the Mountains/Alps from Cobungra/Nunniong:

- In the Alps above Licola at **Mt Tamboritha**, Alt. 1,200m, a population of medium sized *C. montana* with an average a teeth count in the low range for *C. montana*, a distinctive labellum which (relative to most *C. montana*) has fewer larger rather distinctive well-spaced (less crowded) teeth.
 - The RBGM specimen from Wonangatta Mel 578988 is similar. Gary Backhouse's *Caladenia Book CD* has photos of what, from the limited detail, look to be good examples of *C. montana*, viz:
 - Plants from a lower altitude near Licola (M. Duncan)
 - Mt Samaria, north of Lake Eildon (L. Peggie)
 - Cathedral Range, South of Lake Eildon (L. Rogan); and
 - RBGM has many older specimens from what are now the eastern suburbs of Melbourne. Some approach the appearance of *C. montana* but are probably attributable to other, similar species.
- These scattered records indicate *C. montana* may be more extensive in these areas, and may even extend to mountain areas closer to Melbourne?



Both Mt Tamboritha Alt. 1,200m,

How extensive, and how far west?

END NOTE 1

Data Charts

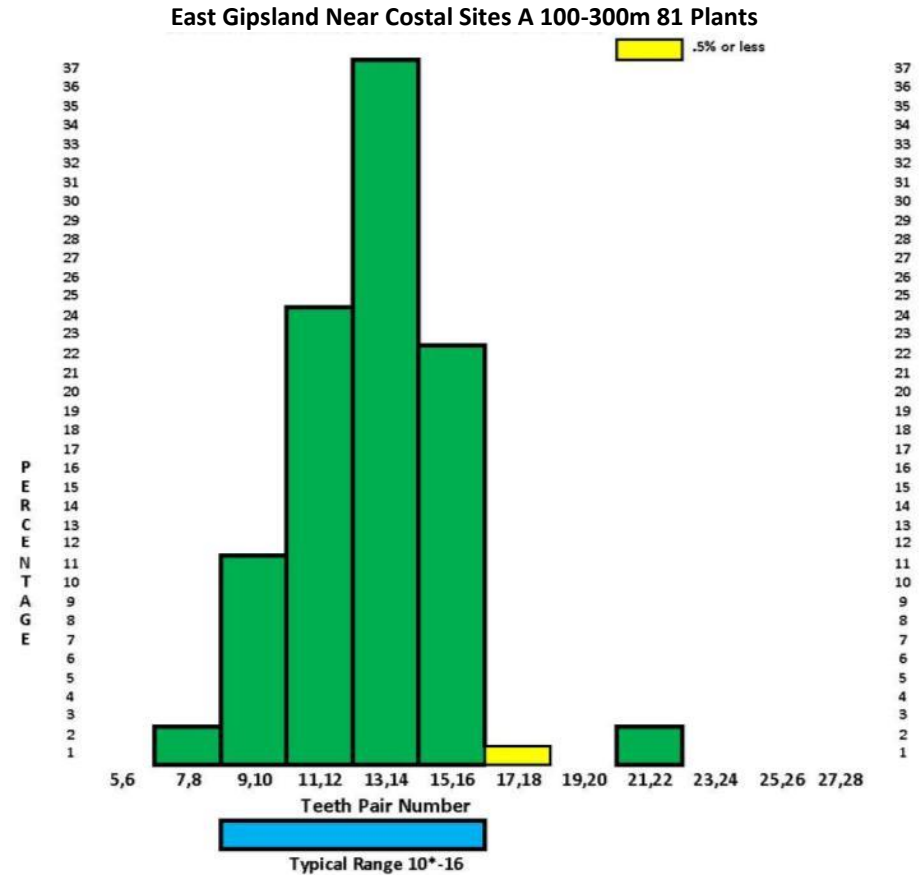
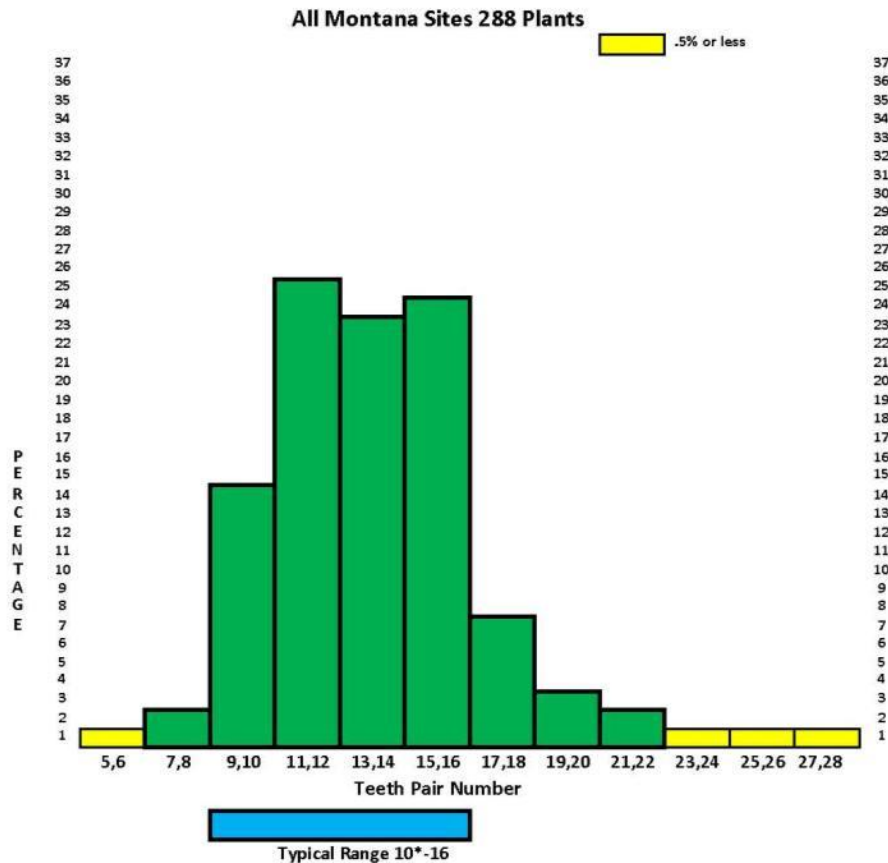
These Chart the range of teeth numbers by percentage for the different groups of plants charted. They show some fairly minor differences between locations, existing within a fairly narrow and uniform typical teeth range.

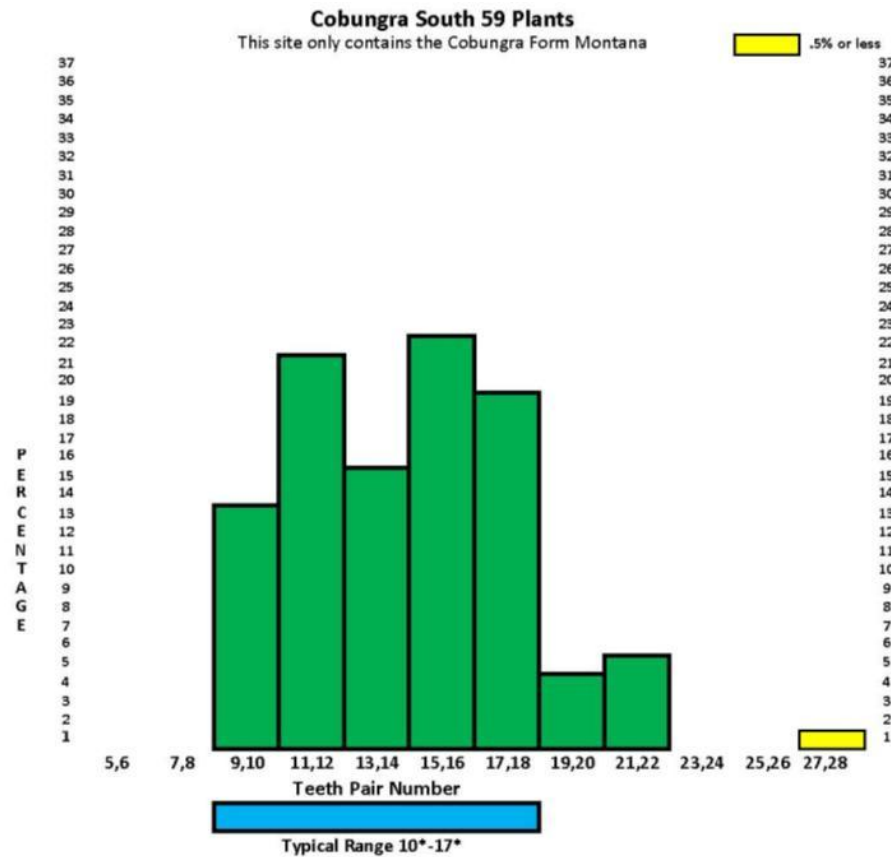
These Charts compare the teeth range of all my sites to the Cobungra South and East Gippsland Costal sites

When read with my more detailed spread sheet data they show for:

- **All Sites** most (82%) within a typical teeth range of 10 to 16.
- **East Gippsland Costal sites** a high proportion of plants (87%) within the 13-14 range and a greater concentration of plants (91%) within the 10*-16 range.
- **The Cobungra South site** (where all plants are the Cobungra Spider) a generally wider spread with only 66% of plants within the 10-16 range, 83% within 9-16 and 90% in the 9-18* range. This also reflects the slightly higher than average teeth count seen in this form.

The total number of plants (288) shown here differs from my Data Table Total of 336 due to the later addition of more plants to the data table.





END NOTE 2

THE MORPHOLOGY OF C. OSMERA COMPARED WITH C. MONTANA

Gut reaction is an underrated analytical tool, especially when one is immersed in the subject matter of the reaction, as I had been with these spider caladenias. My gut reaction on first seeing the patch of *C. osmera* near Cann River from which at least one of the 2 type specimens was taken (the type patch), was that I was looking at *C. montana*. My gut reaction when I visited my Knocker Site U, in the High Country, was that the plants there looked just like the *C. osmera* in the type patch. With the photos I had taken at both sites I was able to test whether these gut reactions had substance. What I did was to select the best 6 photos of the 8 *C. osmera* plants photographed in the same patch from which one of the type specimens was taken. Then from the 14 *C. montana* photographed on a visit to Knocker Site U, I selected the photos of 6 flowers that best matched the angle, detail, features and colour of each of the 6 type patch photos.

My contention that the plants in the *C. osmera* type patch are morphologically identical to the *C. montana* at my Knocker U site is supported by the following: (a) My measurements of the Knocker plants and flowers gave a similar size range as the smaller *C. osmera* at the type locality. Typically lateral sepals 25-35 mm long, and petals 20-30mm, with some smaller plants/flowers, and some larger; (b) The Average Teeth Count for all *C. osmera* at the type locality is 13.10, Average Teeth Range 10-16 (for all coastal sites ATC 13.17 ATR 10-16) almost the same as the Knocker site U's ATC 13.29 and ATR 10-16 and to the All Sites ACT 13.28 and ATR 10-16. Judge for yourself, and when you look at these plants consider how many have faint, or stronger, reticulate veining.

BELOW: *C. osmera* type patch [TL]

Altitude 280m - 25 Sept 2010



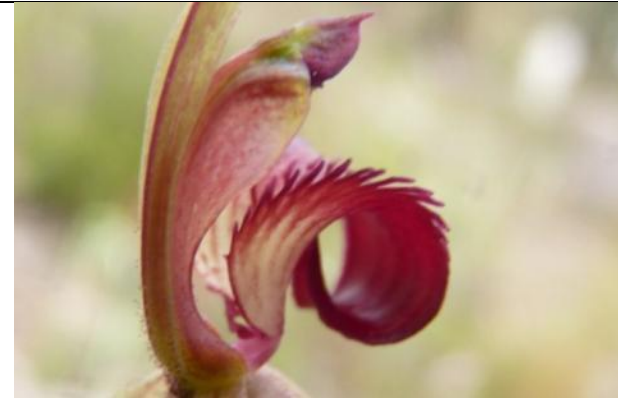
TL Patch 4 Flower 1.7

BELOW: *C. montana* Knocker Site U [KU]

Altitude 960m - 5 November 2010



KU Flower 3.32



TL Patch 4 Flower 2.14 [with tighter curl]



KU Flower 4.46



TL Patch 4 Flower 4.25



KU Flower 11.141



TL Patch 4 Flower 5.30



KU Flower 5.27



TL Patch 4 Flower 7.46



KU Flower 12.148



TL Patch 4 Flower 8.33



KU Flower 4.54 (one of a double)