bodies and the latter numerous, small oil bodies. There are other morphological features that distinguish these genera, but the number and structure of oil bodies provide by far the easiest characters.

Further information and descriptions for the commoner species may be found in K W Allison and John Child's book "The liverworts of New Zealand" published in 1975. Some beautiful illustrations of liverworts can be found in Bill and Nancy Malcolm's book "The forest carpet", published in 1989.

REFERENCE

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Corybas rivularis – One Species or Several?

Bruce Irwin[1]

As early as 1938, my interest in native orchids prompted me to record them in a series of water colour drawings. Very soon I became aware of the considerable variation within any one species. Near New Plymouth, one particular species, *Corybas rivularis* (then known as *Corysanthes rotundifolia*) varied remarkably both in shape and colour pattern, yet I accepted them all as variations of a single species. However, in 1949, my friend Owen Gibson, sent me flowers of a large, deep red *Corybas* from Onaero 25 km N.E. of New Plymouth. Clearly this was not *C. macranthus* and it could scarcely be included within *C. rivularis*. Was it a hybrid? Was it perhaps an unnamed species?

More than thirty years passed before I could follow up Owen's find. His colony at Onaero persisted and I found further flowers 100 km northward near Waitomo. These I showed to Tony Druce who, without hesitation, said it must be an unnamed species. From then on, I applied the "tag" name *Corybas* "A".

Already I suspected that the small green form of *Corybas* so common on Mt Messenger in North Taranaki, was distinct from other forms near New Plymouth. I came to think of this plant as *Corybas* "Mt Messenger".

In 1987, I heard from Rob Ward of New Plymouth that he had found a strange *Corybas* at Rerekapa about 15 km east of Mt Messenger. When I visited the site, I was surprised to find that Rob's plant matched those of a small colony I had seen near Wanganui in 1949. At that time I had regarded them as an aberrant form of *C. rivularis* with very short lateral tepals. Very importantly, at Rerekapa, three quite distinct forms of *Corybas* grew side by side without any sign of intermediates. They were *Corybas* "A", *Corybas* "Mt Messenger" and Rob's *C.* "short tepals", all of them distinct from New Plymouth plants. Already it seemed that there were four distinct species included under the name

[1] 192 Bellevue Road, Tauranga.

C. rivularis, though one of them, *Corybas* "A", was more often confused with *C. macranthus*. Obviously it was necessary to make much more precise drawings to determine the limits of each form. I found that drawings of longitudinal sections of labella were particularly revealing. Every September since, I have spent a few days in Taranaki mapping each form of *Corybas* with very willing help from local orchid enthusiasts.

When the Wellington Botanical Society offered financial assistance through its Jubilee Award, I applied for and was granted $500. Obviously this would enable me to range further afield in my efforts to map the four forms of *C. rivularis* then known to me. Not for a moment did I imagine that I would also stumble on to another three forms during the 1992 season. For a few days immediately before the "Annual Taranaki *Corybas* Crawl" I was joined by Dr Brian Molloy of Landcare Research, Lincoln. Our first objective was to relocate at Waiouru, the *Corybas* to which Dan Hatch had given the name *C. macranthus* var. *longipetalus*. We found our quarry during a driving hail storm, already flowering (8 September) in exposed subalpine conditions. It was not *Corybas* "A" as I had expected, although the leaf was distinctly petiolate much as in *Corybas* "A". Here was a fifth *Corybas* to be added to my list. Rather similar plants were seen two days later, inland from Kai Iwi. I need to look more closely at *C.* "Waiouru" ("longipetalus") this coming season, hopefully under more favourable conditions. When Brian and I reached New Plymouth, John Dodunski showed us yet another form of *C. rivularis* on the banks of Te Henui River. This was a small flower with a red, very narrow, forward jutting labellum. Only the very first flower was open so I was undecided as to its status until a few weeks later when Dan Hatch gave me matching plants in flower. These had been cultivated by him from plants originally collected by Doug McCrae at Kerikeri. This, the sixth form to come to my notice, I have "tag" named *C.* "kerikeri".

I was becoming embarrassed by the number of apparent species within *C. rivularis*, yet there was still another form to check on. In October 1985 I had made incomplete drawings of a small green *Corybas* found at a rest area, north of the Desert Road Summit. On our way south to Waiouru on 8 September, Brian and I had searched for but not found this *Corybas* "rest area" and assumed it could still be below ground. However, when I again searched the rest area on 28 October, I had to conclude that it had disappeared without trace. Later that day I continued on to a wetland at Rangataua where, to my delight, I found a single flower which matched my 1985 drawing. This brought the tally of forms to seven. Three other *Corybas* were present in the wetland. They were *C. macranthus* with tiny buds; two shapely red flowers I presumed were *macranthus* × *trilobus* hybrids, though they differed from presumed hybrids at the northern end of the Kaimai Range (*N.O.G. Journal No. 44*); and finally a reddish form resembling *C.* "Waiouru", growing in sphagnum cushions.

The following day I checked a thriving *Corybas rivularis*? colony near the Hillary Outdoor Pursuits Centre. I examined carefully the thousand or so plants without finding any trace of flowers. Just possibly in this very shady and wet site, the colony has increased solely by vegetative reproduction. Disappointed, I returned to Rangataua, entering and emerging from the wetland at precisely the same points as on the previous day, yet the whole character of the area had changed. I refuse to believe that I lost my way in the wetland. I prefer to believe that goblins had rearranged things overnight. How else could most of the *C. macranthus* have disappeared and been replaced by large numbers of *C.* "rest area", many of them flowering - and how else could the *macranthus* x *trilobus* have changed to a small colony of *C.* "short tepals". I wonder what I shall find in my enchanted wetland next season?

The following notes together with drawings and key should help distinguish the seven forms of *Corybas* at present included within *C. rivularis*, but which may warrant species or at least varietal rank.

Corybas "short tepals" is easily distinguished by its short tepals and scoop-shaped labellum. It is thinly distributed, apparently over most of New Zealand. Now considered to be identical with Colenso's *Corysanthes orbiculata*. (Brian Molloy, January 1993, pers. comm.)

Corybas "A" is particularly common throughout inland areas of Taranaki/Wanganui. It is possibly present throughout New Zealand. This form can be recognised by its large, wide labellum, its dark red colour and particularly by the bead-like gland at the entrance to the column cavity. Smaller paler plants which I once considered to be forms of "A" are perhaps closer to *C.* "Waiouru" but require further study.

Corybas "Waiouru" ("longipetalus") is the plant to which Dan Hatch gave the name *C. macranthus* var. *longipetalus*. Like *Corybas* "A" this form has a distinctly petiolate leaf but the flower is smaller and paler, showing as much green as red. The dorsal sepal is narrower and barely flecked red. The longitudinal section of the labellum is quite distinct and lacks the beadlike gland at the inner flexure. *C.* "Waiouru" flowers in early September under subalpine scrub. Plants from Upper Kawhatau (east of Mangaweka) and from Junction Road (inland from Kai Iwi) may be identical.

Corybas "Mt Messenger" seems almost confined to Taranaki. Predominantly green, it is the most common form of the *rivularis* complex in North Taranaki. In South Taranaki it gives way to *Corybas* "A" but in many northern areas these two plants grow side by side. I had thought that *C.* "Mt Messenger" tolerated only very wet sites, but in 1992 Margaret Menzies gave me flowers indistinguishable from this form which were

growing happily with *Pterostylis alobula* within 3 m of a dry ridge top at Omoana. Structures of *C.* "Mt Messenger" resemble *C.* "Waiouru" but the colour pattern is quite different and the leaf is strictly sessile.

Corybas "rest area" has a very similar colour pattern to *C.* "Mt Messenger". Main differences are:

(1) The dorsal sepal tends to stand erect, often clear of the labellum.

(2) As seen from the front, the labellum has a wide, rounded entrance to the column cavity and tapers to an acute apex.

(3) In longitudinal section, the labellum has a much more slender "flat" between the two flexures.

At present known from a single locality at Rangataua. Flowers mid October.

Corybas "Kaimai" differs from previous forms by:

(1) Having an evenly tapered labellum.

(2) The entrance to column cavity is particularly acute.

(3) In longitudinal section the labellum is very distinct. The "flat" between flexures is long and slopes downward towards the apex. Also the ventral surface below the inner flexure is very sharply bent, not smoothly rounded.

This seems to be the only form of *C. rivularis* present on the Kaimai Range. It extends to the Coromandel and possibly the Waitakere Ranges and is occasionally found near New Plymouth.

Corybas "Kerikeri". John Dodunski first showed me this distinctive little *Corybas* at New Plymouth when the first flowers were barely open. Despite the dark red colour of the labellum, because basic structures clearly resembled those of *C.* "Kaimai", I thought this might be a local variation of that plant which it might more closely resemble when mature. Later I was given almost identical, mature flowers from plants originally growing at Kerikeri Falls. Clearly, these and the New Plymouth plants should be regarded as a separate species, distinguished by the very narrow labellum on which the outer flexure is barely developed. This causes the apex to project forward, well clear of the ovary. Kerikeri Falls was one of the localities where Cunningham originally collected his *Acianthus (Corybas) rivularis*. Perhaps this is the true *C. rivularis*?

My observations on *Corybas* have so far been confined to a relatively small part of New Zealand, so that distributions mentioned above, may be far from accurate. It is also possible that further forms remain undiscovered.

KEY TO SEVEN FORMS OF *CORYBAS* WITHIN THE *RIVULARIS* COMPLEX

(1) Leaf virtually sessile .....(2)
Leaf petiolate (not always obviously so) .....(5)

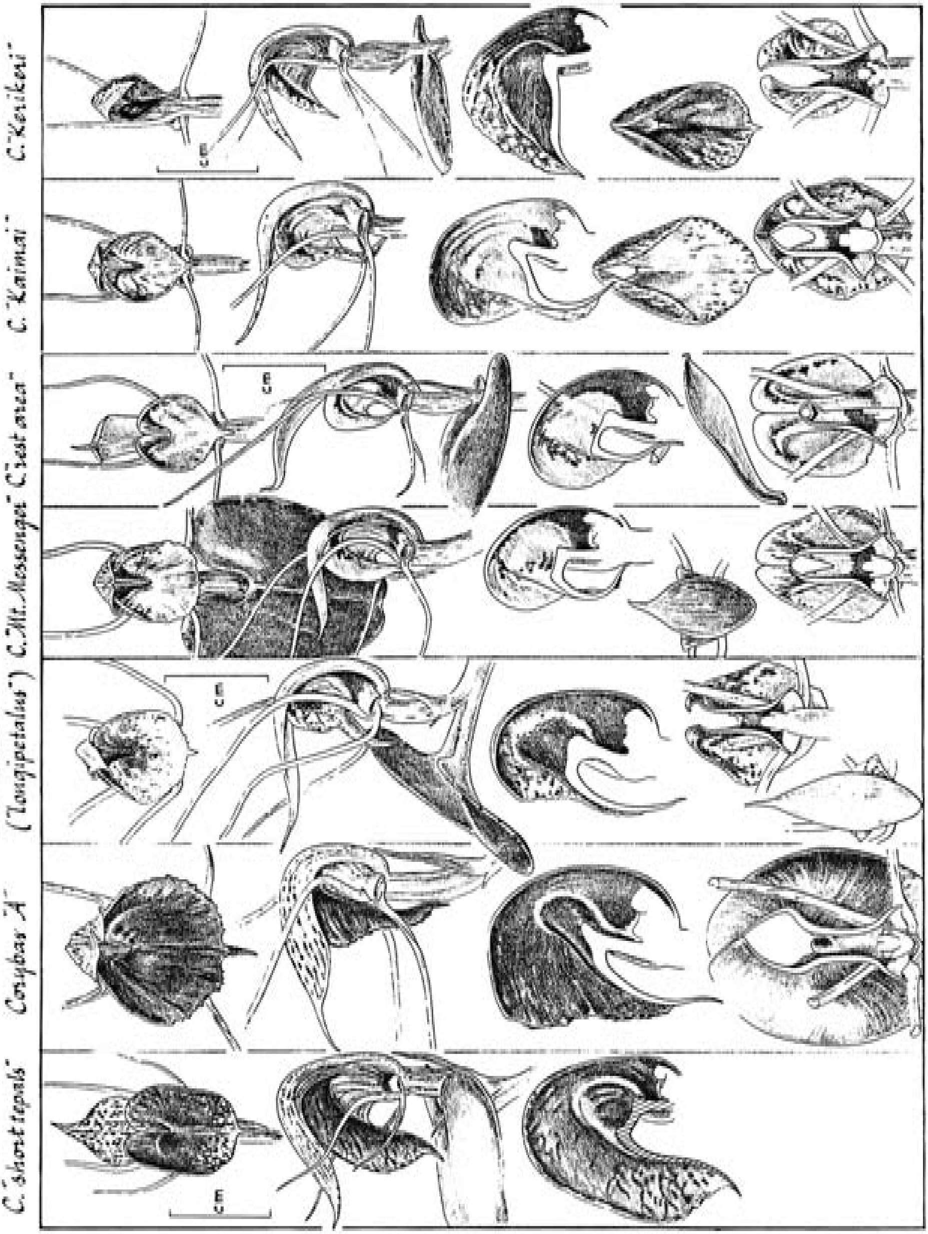
(2) Labellum tapering to acute apex .....(3)
Labellum tip obtuse, though apiculus present ....."Mt Messenger"

(3) Flower very narrow, usually red, labellum projecting forward almost horizontally ..... "Kerikeri"
Apex of labellum strongly down-pointing ..... (4)

(4) Labellum ± rhomboidal, gradually tapered to acute apex which is well below level of auricles, throat sharply V-shaped ....."Kaimai"
Labellum rather abruptly narrowed to acute apex barely reaching down to level of auricles..... "rest area"

(5) Lateral sepals and petals < twice length of dorsal sepal .. "short tepals"
Lateral sepals and petals > twice length of dorsal sepal ..... (6)

(6) Flower large, wide, usually dark red. Entrance to column cavity very high on labellum which is very sharply deflexed at this point. A prominent bead-like callus further restricts access at flexure ....."A"
Flower smaller, less highly coloured. Longitudinal section of labellum shows two distinct bends though the lower surface is ± continuously curved ..... "Waiouru"


C."short tepals"
Corybas "A"
C."Waiouru"
("longipetalus")
C."Mt. Messenger"
C."crest area"
C."Kaimai"
C."Kerikeri"
cm
cm
cm
cm