CREEPING SPECIES OF *COPROSMA* IN CANTERBURY

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Historical background

Until 1974 things were simple, there only two creeping coprosmas; *Coprosma pumila* and *C. petriei*, the latter with two varieties var. *petriei* and var. *atropurpurea*. We didn't worry too much about attempting to distinguish the two varieties unless they were in fruit. Bill Philipson (in Philipson and Herne 1962, p.102) in comparing the fruit of the two varieties has this to say: 'In the other type (var. *petriei*) the smaller more opaque berries are at first a creamy yellow which becomes more and more obscured, as the season advances, by minute blue flecks. These can scarcely be seen without a lens, but they transmute the yellow into an eerie green which gradually intensifies'. Deep blue berries have also been reported. What ever the colour they are easily distinguished from the semi-translucent wine red (you have the choice of port or claret) globular to ovoid, over 1 cm long berries of var. *atropurpurea*. Var. *petriei* berries are nearly globular and less than 1 cm long. *C. pumila* was distinguished from *C. petriei* by the absence of hairs on the leaves and stems and by the orange-yellow to reddish orange berries.

However, Moore and Mason (1974) raised the status of *C. petrei* var *atropurpurea* to specific rank. So we then had three species. Orchard (1987) increased the number of species to four when he revised what he called the '*C. pumila* complex', even though he removed *C. pumila*, taken in a strict sense, from the New Zealand scene, by pointing out that it was a Tasmanian taxon where it was confined to the central highlands. In its place he added *C. perpusilla* (very small), plants typically with female flowers having four styles and four pyrenes, and *C. niphophila* (snow-loving), plants with two styles and two pyrenes.

Coprosma pumila complex

J. Hooker (Hook f) in 1837 described and named a taxon *C. repens*, though the material he used came from Auckland and Campbell Islands, and Tasmania, according to Orchard (1987). It has since been shown that the Subantarctic and Tasmanian plants are not identical. Hooker further confused the issue when he used the epithet *repens*. This epithet had been used previously by Richard (1832) for a broadleaved *Coprosma* we know in Canterbury

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(taupata; though it is probably adventive, Mason 1980). Hooker persisting in the use of *repens* for the creeping species, then called the small tree we know as taupta *C. retusa*, following Banks and Solander. Hooker then used the name *C. baueriana*, which was later corrected to *C. baueri*. This persistence is carried on by Hooker's successors at Kew. In the foyer of the magnificent new Princess of Wales Conservatory at Kew Royal Botanic Garden there is a fine specimen of *C. repens* A. Rich 1832, labelled *C. baueri* Hook f. (country of origin New Zealand).

All this aside, Hooker in his Handbook of the New Zealand Flora (1864) had two species of prostrate *Coprosma* in New Zealand: *C. repens* with 3-4 styles and distribution, 'Northern Island : open grounds near Lake Taupo, Colenso. Lord Auckland's group and Campbell's Island : common on the hills, J.D.H. Probably common in the Southern Alps, but I have seen no specimens'. *C. pumila* with 2 styles and distribution, 'mountains of the Northern Island : summit of Ruahine Mountains, Colenso. Middle Island : subalpine regions near the Great Godley glacier, Haast; Otago, lake district, Hector and Buchanan.' Kirk (1899) maintained *C. repens* but reduced *C. pumila* to a variety of *C. repens*, *C.repens* var. *pumila*. Cheeseman (1925) dropped the variety but retained *C. repens*. Oliver (1935) identified Hooker's mistake in using the epithet *repens* but unfortunately confounded the confusion by deciding that I Hook f. was just a habit form of *C. repens*, and as *repens* was not available placed both Hooker's species in *C. pumila*. Taxonomists! Oliver did note that the next available name for *C. repens* was *C. perpusilla* which Colenso had used for a specimen collected near the base of Mount Tongariro. The treatment by various authors and artists in describing the flowers and fruits of *Coprosma pumila* is summarized in Table 1.

The first three authors on the list called their specimens *C. repens* Hook. F. Oliver (1935) made the change to *C. pumila* Hook. f. and this name persisted until 1986 when A.E. Orchard of the Tasmanian Herbarium identified *C pumila* as an Australian species not growing in New Zealand. He then identified that what had been called *C. pumila* in New Zealand was really two species. He called one taxon *C. niphophila*, a new name , and for the other revived Colenso's name *C. perpusilla*. Orchard also described a new subspecies, *C. perpusilla* var. *antartactica*, confined to Macquarie, Auckland, Campbell, and Antipodes Islands. The plant found in Canterbury is therefore *C. p. perpusilla*. The differences between the two subspecies are mainly stipule shape and indumentum, bending of petiole at base, and development of abscission zone between petiole and stem, but not in the flower or fruit.

Table 1: Historical treatment of *Coprosma pumila*.

Author	Stamens	Styles	Drupes	
			Colour	pyrenes
J Hooker 1864				
C. repens (T)	not seen	smts 3-4	orange-yellow	2-4
C.pumila (T)	-	2	orange-yellow	-
Kirk 1899				
C.repens (T)	4-8	2-4 rarely 3-5	orange-yellow or red	2-4
C.r. var. *pumila* (T)	-		orange-yellow	-
Cheeseman 1925				
C.repens (T)	4-8	2-4 rarely 3-5	red or orange-yellow	-
Oliver 1935				
C.pumila (T)	4	2-4 . us. 3-4	red	2-4
Richard 1956				
C. pumila (T)	4-8	2-4	orange or red	-
Allan 1961				
C. pumila (T)	4-3	(2)-3-4	red	2-4
Poole & Adams 1964				
C. pumila (T)	-	-	orange-red	4
C. pumila (I)	-	4	-	-
Mark & Adams 1973				
C. pumila (T & I)	3-4	long-branched	shiny orange	-
Moore & Mason 1974				
C. pumila (K)	-	-	orange	us 4
Moore & Irwin 1978				
C. pumila (T)	3-4	4 not 2 as us.	reddish-orange	us 4
C. pumila (I)	-	4	orange	-
Wilson 1978 & 1982				
C. pumila (I) 1978	-	4	orange	-
Eagle 1982				
C. pumila (T)	-	3-4 instead of 2	-	-
C. pumila (I)	4	4	-	-
Orchard 1987				
C. perpusilla (T)	4	3-4	yellow-orange to	3-4
C. perpusilla (I)	4	4	orange-red	-
C. niphophila (T)	4	2	orange-red	2
C. niphophila (I)	4	2	-	-

(T: text. I: illustration. K: key.)

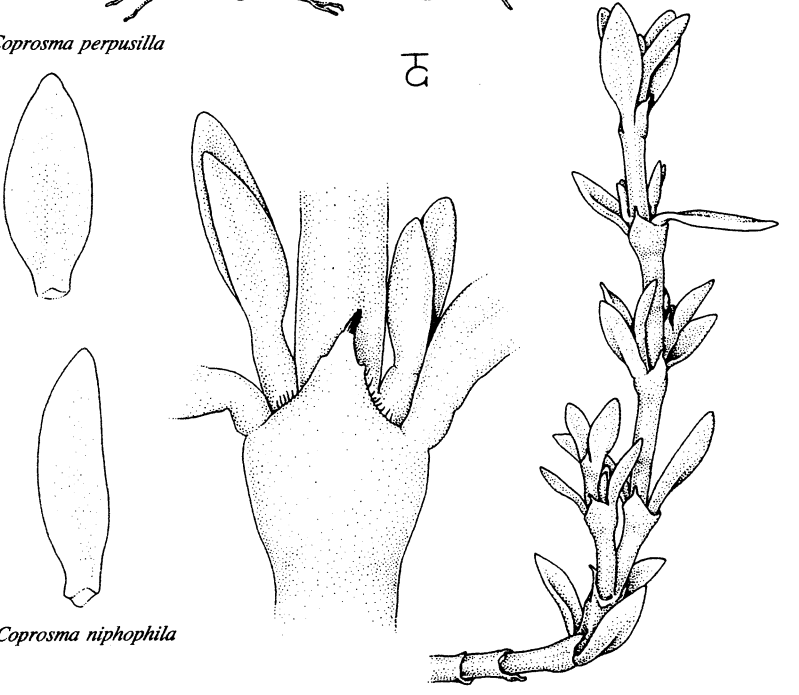
Considering that two different species had been placed in *C. pumila* it is not surprising that there is some variation in characters such as the number of styles and pyrenes, and this may certainly account for two or four styles of some authors but not for three. Careful examination of flowering plants of *C. perpusilla* (*C. pumila*) in the field has not shown any true three-styled flowers, but what it has shown is that as the flowers mature the styles wither, usually one or two before the others and the exerted portion drops off, which could lead to them being accepted as three-or two-styled flowers. However close examination, helped by the fact that the corolla at this stage, can easily be detached from the ovary by a slight pull, shows the styles and their attachment to the ovary fully exposed. In each case examined there was evidence that originally there were four styles. This does not agree with the statement in Orchard (1987 p.133), 'New Zealand plants have predominantly 3 styles in their female flowers with 4 less common'. In Australian plants 4 styles are more common than 3. Other evidence that supports the view that New Zealand plants are the same as their Australian relatives in the number of styles, if we accept that Orchard (1987 p.120) is correct when he states, 'The number of pyrenes in the fruit matches the style number', comes from fruit sent into the New Zealand (formerly Canterbury) Alpine Garden Society Seed Exchange. Such fruit almost inevitably contained four pyrenes, though some collections contained only two, and were most probably fruit of *C. niphophila*. Again, if as Orchard states, that three-styled plants are the usual in New Zealand then it is surprising that five New Zealand artists have chosen to draw four-styled flowers, often several in the one figure, but never a three-styled one.

Diagnostic features of the four creeping *Coprosma*

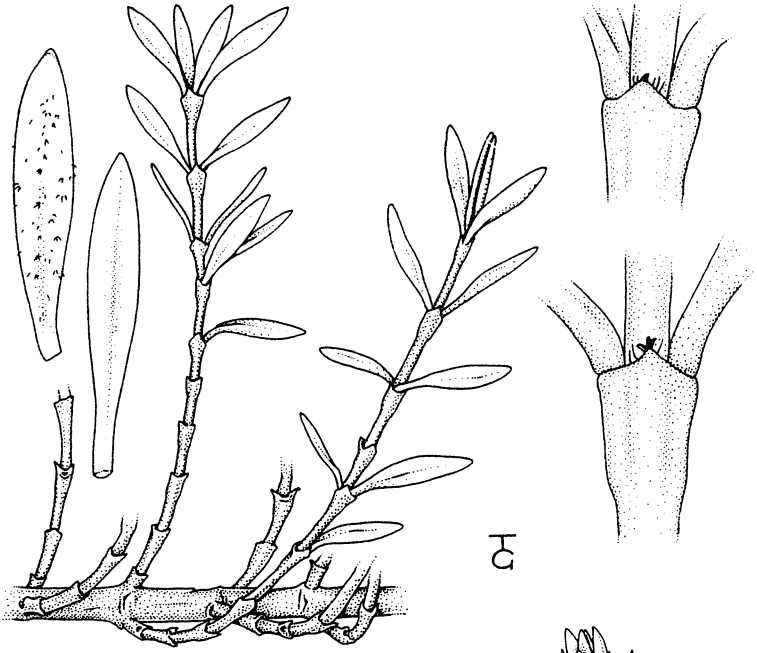
Prostrate subshrubs, with main branches up to 50 cm long, except for *C. niphophila* which is described as a shrub and may have trailing stems up to 1 m long. The leaves are borne on short shoots, usually not more than 5 cm long, and are of lanceolate, oblong, or ovate order, and under 1 cm in length. The flowers are unisexual with the exception of *C. niphophila* where both male and female flowers may have vestigial remnants of the opposite sex. Orchard (1987 p.136) states, 'these remnants are, in an appreciable number of flowers functional'. All four species have male and female flowers on separate plants (i.e. dioecious).

Inter-petiolar stipules, which are a distinguishing feature of all *Coprosma* species, can be used to separate the four species based on their shape, presence or absence of hairs, and number and position

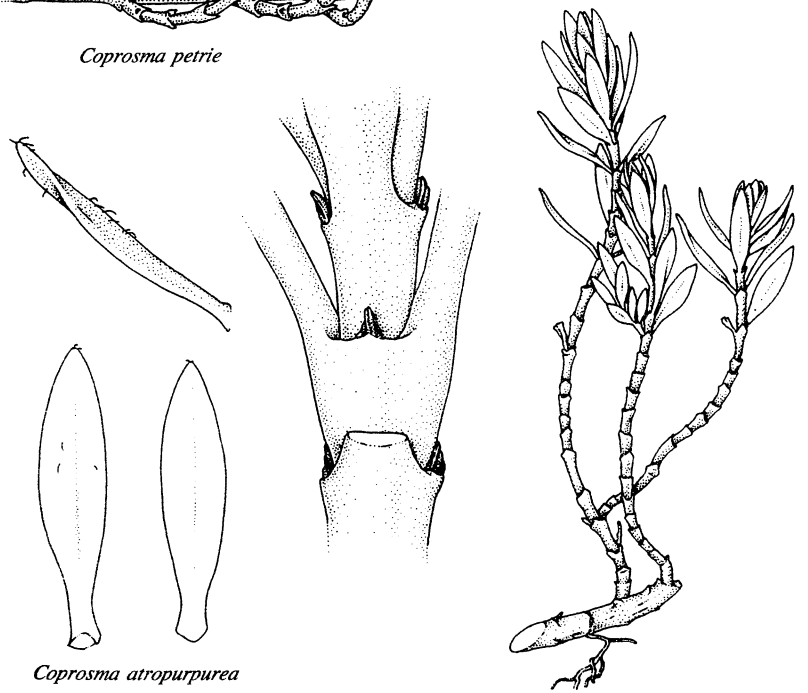
Coprosma perpusilla



Coprosma niphophila



Coprosma petrie



Coprosma atropurpurea

of denticles. Stipules tend to become ruptured as the branches increase in diameter, and L. Moore (in Moore & Irwin 1978, p.132) states, 'best seen on vigorous young shoots', and Orchard (1987, p.120) 'stipule shapes . . . . are those of the short shoots 2-3 nodes below the apex where the leaves are just attaining full size'. A summary of the main characteristics is presented in Table 2.

Key to the species of creeping *Coprosma*

1. Leaves, at least when young, with backwardly pointing hairs . 2
   Leaves glabrous. 3

2. Leaf hairs in clusters of two or three, often on margins, never at tip . . . . . *C. petriei*
   Leaf hairs, single, rare on margins, often 3-4 up-standing at tip
   . . . . . *C. atropurpurea*

3. Stipules bluntly deltoid, 1-3(-5) denticles, fringe of hairs on edge, equalling or exceeding denticles, often hiding them . . . . . .
   . . . . . *C. perpusilla*
   Stipules deltoid, attenuate at tip, terminal denticle,0-3 lateral denticles, fringe of hair that does notobscure denticles
   . . . . . *C. niphophila*

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Table 2: Diagnostic characters of creeping *Coprosma* species.

Coprosma atropurpurea
Young leaves with coarse retose hairs to 0.5 mm long on matgins and upper surfaces, often retained on older leaves.

Corolla of female flowers with similar hairs on outer surface of lobe and sometimes on upper tube.

Male flowers lack calyx.

Coprosma perpusilla
Young leaves with sparse crisped hairs to 0.2 mm long mainly confined to margins (rarely on upper surface).

Corolla of female flower glabrous.

Male flower with shortly tubular 4-lobed calyx.

Coprosma petriei
Branchlets often with sparse, stiff, appressed hairs.

Hairs on leaves denser.

Stipules rounded or at most shortly deltoid.

Corolla tube of male flowers 2.9 - 4.0 mm long.

Coprosma niphophila
Branchlets glabrous.

Hairs on leaves sparse and generally confined to youngest ones.

Stipules distinctly deltoid.

Corolla tube of male flower 4.0 - 4.5 mm long.

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Acaena sp.