

## A ROSE BY ANY OTHER NAME?

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Amateur and professional botanists alike are plagued by changes in the scientific naming of plants. If you are at times irritated or perplexed by being expected to call a well-known and much-loved species by a new and unfamiliar name, be assured that you are not alone. Some examples of name-changing seem so extreme that sometimes they cause otherwise passionate and committed plant lovers to throw up their hands in surrender!

Take the common hound's tongue fern or kōwaowao. As a boy I learned the English, Māori and scientific names at the same time. That was a long time ago (in the 1950s). The scientific name I learned was *Phymatodes diversifolium*. It was published by an Italian botanist called Pichi-Sermolli in 1951, based on *Polypodium diversifolium*, which the German botanist Willdenow had published in 1810, the year that the Scottish botanist Brown named the same taxon *Polypodium billardieri*. Czechoslovakian botanists JS and CB Presl placed it in their new genus *Phymatodes* in 1836, but the American botanist Copeland referred the species to Link's genus *Microsorium* (1833) as *Microsorium diversifolium* in 1929. During my lifetime the name has changed from *Phymatodes diversifolium* (the name which Allan accepted in his 1961 Flora) to *Phymatosorus diversifolius* (the name *Phymatodes* proved to be illegitimate under the International Code of Botanical Nomenclature), then to *Phymatosorus pustulatus*, and most recently to *Microsorium pustulatum*, with the spelling of the generic name corrected back to Link's original form (Fig. 1, page 64).

Believe it or not this is a substantially simplified version of the fern's nomenclatural history. I have some hope now that the name *Microsorium pustulatum* might stick. I also acknowledge that the relationships of this familiar fern are now much better understood than before.

Throughout the turbulent transmutations of the botanical names, the vernacular names hound's tongue fern and kōwaowao in New Zealand, kangaroo fern in Australia, have been in unperturbed use. It's worth noting that many familiar botanical names have sailed through the centuries unchanged including many found wild on Banks Peninsula (Table 1, page 74). Is there a general longing for the sort of nomenclatural stability exhibited by these plants to be much more widespread? I expect so. There is much to be said for it. It would facilitate communication. It would safeguard historical continuity. It would greatly simplify the work of herbarium curators.

It's a great irony though that an over-emphasis on stability would risk stultifying progress in botanical research and understanding. When Swedish botanist Linnaeus invented his binomial (genus and species) system in the mid 18<sup>th</sup> Century, it quickly proved an excellent basis for advances in



**Figure 1** The common hound's tongue fern or kōwaowao (*Microsorium pustulatum*) and other ferns (as named). Original drawing by the author.

taxonomic and phylogenetic understanding. Subsequently the legalistic International Code of Botanical Nomenclature was developed by consensus among botanists to provide a wonderfully productive, rational framework for the scientific naming of plants. It required, for example, that the earliest validly published name for a taxon had precedence over later-published names, creating with one simple rule impressive order out of potential chaos.

The rule of precedence in itself had pitfalls. The belated discovery of an earlier name could upset a long-used, familiar, established name. This sort of situation, surprisingly common, could be particularly disruptive in the case of economically important species, such as food crops, fibres, drugs, ornamentals or timber trees. So the Code developed a provision that, by agreement at international meetings, such long-established names could be conserved in the interests of stability. An example is the conserved name *Bambusa*, published by the German botanist von Schreber in 1789. *Bambusa* is the largest genus of bamboos, with more than 100 species.

There is a deeper-seated problem, however, in our system of naming plants. It tries to do two things at once. On the one hand it attempts to provide a simple naming and pigeon-holing service so that we can communicate easily about plants. On the other, it aims to reflect evolutionary descent or relatedness. Charles Darwin was certainly aware of both roles. He predicted "Our classifications will come to be, so far as they can be made, genealogies". Unfortunately, the two demands don't always sit comfortably together.

It has to be admitted that most name changes are the inevitable result of increasing knowledge about plants. Troublesome though the changes might be, they add up to a price worth paying.

In recent years new information has come thick and fast from leading-edge technologies such as DNA analysis, providing unprecedented, undreamed-of evidence of relationships. The molecular evidence mostly, but not always, supports what we had surmised from more traditional approaches such as the detailed study of plant morphology. The new information has also strengthened the resolve and ability of many taxonomists to produce a more "natural" classification, one that will more accurately portray evolutionary descent. The Holy Grail, the desired goal, would be to ensure that every taxon, at whatever level (species, genus, family, class, etc.), is monophyletic - that is, that each taxonomic name should be applied exclusively to a group of organisms derived from a single line of descent, having strictly one common ancestor (usually "common ancestor" means an ancestral inter-breeding group or population of individual organisms).

On the face of it that looks scientifically sound, even if it sounds ominous for name stability over the coming decades. Certainly we know that many named taxa are not currently monophyletic, especially at generic and family levels. Some genera, for example, lump together descendants of more than one ancestral lineage through misinterpretation of apparently similar morphology; they are polyphyletic. Such genera may need splitting or revising. Other genera include some but not all descendants of a common ancestor (they are paraphyletic), implying that two or more genera might need merging or rearranging.

Much more knowledgeable and perceptive minds than mine have criticised a single-minded pursuit of monophyly. They point out that, taken to its logical conclusion, the end result might have to be one genus of, say, flowering plants!

Where and why, the critics ask, do you call a halt in going back in time to find a common ancestor? An even more cogent criticism they raise, is that evolution does *not* consist solely of the splitting of lineages. Much of evolution is reticulate or combinatorial. Polyploidy (the doubling up of chromosome complements) is prevalent in flowering plants, is a key agent in speciation, and most of these polyploids involve hybridism. Even at the same ploidy level, hybridisation has been long recognised as a major evolutionary agent; genetically stabilised interspecific hybrids are an accepted mode of species formation.

Indeed, way back, the merging of completely different evolutionary lineages ("endosymbiosis" - "living together within") has been spectacularly important among algal groups and is probably responsible for eukaryotic life. Our own mitochondria, for example, essential organelles in our cells, originated as once free-living bacteria incorporated into our remote ancestors. The story is similar for the plastids of green plants which were once free-living cyanobacteria.

Put simply, Nature is too complex and messy to be squeezed neatly into any classification system we might devise. That should warn us that our taxonomic quest is not to discover some perfect exterior objective truth, but to achieve a workable, productive, predictive-as-possible approximation of the real world. That should mean that there's plenty of room for some pretty arbitrary decisions and compromises. And despite the rules and constraints of the Code, taxonomy leaves substantial space for subjective decisions and varying opinion. Even our concept of "species" is itself complex, messy, manifold, inconsistent, and to some degree arbitrary.

I hope that means we can tweak and manoeuvre and make allowances in our human-devised classification to keep the purpose of nomenclature *practical* for everyday use, without being *too* obsessed by having the names reflect a phylogenetic certainty that is by nature unattainable.

Why this long preamble? It is because I am publishing a book *Plant Life on Banks Peninsula*, in which I have tried to adopt newly published names that seem to me to be clearly justified and useful, but in which I also tend to be cautious and conservative about some name changes that *don't* seem to me to be convincing or helpful.

Years ago Dr Lucy Moore gave me some good advice. She said "You don't have to follow every newly published name. You don't have to think that the most recently published revision is necessarily the best. As a botanist, be critical. Assess new names. Do the arguments convince you? If not, stick to the names we have been using, at least until you are convinced otherwise, or unless the names have clearly been shown to be wrongly applied or illegitimate."

It's fine for Dr Lucy to ask that of a fellow botanist, even if that fellow botanist was barely worthy of traipsing along in her shadow! But it's a lot to ask of "amateur" plantspeople. They can reasonably expect some sort of leadership from "professional" plantspeople about the names they should use. Landcare

Research / Manaaki Whenua has been helpful in providing that sort of leadership.

It leaves me with a dilemma. If most people simply accept uncritically every new name that is validly published, does someone like me only increase confusion by holding onto names that most people are abandoning? Alas, I feel it is my duty as a botanist to be judgemental and cautious. To reduce possible confusion *Plant Life on Banks Peninsula* contains a lot of synonyms (in brackets) in the main body of the text, in the checklists, and in the index. Some of the bracketed names I might well accept after further serious consideration. Just to illustrate some of my naming quandaries and decisions, here is a sample:

- ***Hebe* or *Veronica*?**

Lots of new evidence and strict monophyly strongly suggest either merging the New Zealand segregate genera (and several others) back into *Veronica* (within which many were originally described and named), or, alternatively, splitting *Veronica* (mainly of the northern hemisphere) into several smaller genera. *Hebe* has been distinguished morphologically from *Veronica* mainly by being woody (subshrubs, shrubs and small trees) and by having opposite leaves. These character states may well be not very good grounds for defining generic differences. Merging *Hebe*, *Heliohebe*, *Parahebe*, *Chionohebe*, etc., back into *Veronica* may prove to be the best outcome, but at present I fear the move is premature. There might be better solutions. I want more time to consider. So I am retaining *Hebe*, *Heliohebe*, and *Parahebe* for the Banks Peninsula book. I note that *Heliohebe* forms a nice distinct group, endemic to the northeast of the South Island, including Banks Peninsula which has its own endemic species. If an expanded *Veronica* does turn out to be the best solution, it would be informative if *Hebe*, *Heliohebe*, *Parahebe* and *Chionohebe* deserve at least subgeneric ranking. Incidentally, I never believed in the recognition of *Leonohebe* at generic or any other rank, but none of those species occur on Banks Peninsula.

- **Orchids**

I find it a bit ironic that just as we are being urged to merge several long-recognised genera back into *Veronica*, some orchidologists have been expecting us to split several orchid genera into numerous smaller genera. *Caladenia* (with around 245 species), *Chiloglottis* (30), *Corybas* (120) and *Pterostylis* (200) seem to me to be "natural" groupings at generic rank. The proposed segregate genera might at best be regarded as subgenera, which would avoid changing long-used binomials. I am certainly not the first to suggest that the difference between genus and subgenus is subtle and subjective, and that in many situations to choose subgeneric rank is a significant nod towards name stability without compromising phylogeny. Hence, although I provide in my book the names of the segregate genera so as to be as helpful as possible, I am not recognising as genera *Petalochilus*

or *Stegostyla* (=Caladenia), *Simpliglottis* (=Chiloglottis), *Nematoceras*, *Molloybas*, *Singularybas*, etc. (=Corybas), *Diplodium* or *Hymenochilus* (=Pterostylis).

Incidentally, David Mabberley (2008) in the 3<sup>rd</sup> and latest edition of *The Plant-book* comments under *Caladenia* "6 subgenera sometimes regarded as genera", and under *Pterostylis* "lately split into 19 'genera', now reunited".

- ***Podocarpus hallii***

There seems to be increasing acceptance of the name *Podocarpus cunninghamii* for the thin-bark totara. HH Allan in *Flora of New Zealand* Vol. 1 (1961) was fully aware that Colenso had suggested the name *P. cunninghamii* in 1884, five years before Kirk had published his name *P. hallii* in 1889, but after careful consideration he concluded "The material and the description are not sufficient to justify taking up Colenso's name against that of Kirk". As far as I am aware there is no new information to help us decide whether Colenso's name was sufficiently published and therefore should take precedence under the Code, but merely another opinion. It would have been more sensible just to stick with Allan's carefully considered judgement, and that's what I'm doing.

A more interesting question might be "What really is the relationship between *P. hallii* and *P. totara*?" Pilger in 1903 published the name *P. totara* var. *hallii* (Kirk) Pilger.

- ***Wheatgrasses***

When I was working in Aoraki/Mount Cook National Park in the late 1960s and 70s, I used the then-available name *Agropyron scabrum* for the variable plants of the long-awned wheatgrasses that ranged from the park's lowest altitudes up into the alpine zone. Life was a lot simpler then.

In *Plant Life on Banks Peninsula* I follow Henry Connor's treatment of the wheatgrasses in the 2<sup>nd</sup> edition of Edgar and Connor's *Flora* (2010), and mention four species under the genus name *Elymus*, three of them long-awned. Of those three, one is considered naturalised from Australia and the other two are considered native. In truth, the variation in the field is enormous, and I have had great difficulty drawing lines between them, often wishing that I could simply call the whole complex *Agropyron scabrum* again!

Since my Mount Cook days the long-awned wheatgrasses have been assigned variously to *Agropyron*, *Anthosachne*, *Roegneria* and *Elymus*. Now another generic name *Connorochloa* has been published for one segment of the complex, called *Elymus tenuis* in the 2010 *Flora*. The new name honours (deservedly) Henry Connor, and I wish I could use it, but certainly not until I make a lot more sense of the wheatgrasses on Banks Peninsula and elsewhere.

- **Cook's scurvy grass**

Just as *Plant Life on Banks Peninsula* was about to go to the printers, a new paper by Peter de Lange et al. (2013) appeared online. It was kindly printed for this Luddite by sympathetic colleagues so that I have it all on my desk as I write.

The paper splits *Lepidium oleraceum* (Cook's scurvy grass) into 11 species, including *L. oleraceum* in the strict sense. It's of special interest to Banks Peninsula, as the one known surviving population of Cook's scurvy grass in the region, on top of one small nearly inaccessible islet, is described as a new Banks Peninsula endemic species, *L. aegrum*. This is the only taxon in the complex known from Banks Peninsula, but other parts of New Zealand have more than one, growing more or less sympatrically. Mangere Island in the Chathams has five, plus another more distantly related *Lepidium*, *L. flexicaule*.

I was able to insert a mention of *L. aegrum* in my book just before it went off to Caxtons Press in Christchurch. However, I confess I am not convinced that *L. oleraceum* is neatly divisible into 11 taxa at species rank. It seems to me more like one variable species, once widespread and more or less continuous round New Zealand coasts from the Kermadecs in the north to the Auckland Islands in the south, and eastwards to the Chathams, but now fragmented by local extinctions.

One of the newly named taxa, *Lepidium seditiosum*, is described as a Bounty Islands endemic species, but known only from the holotype collection gathered in 2004. The collectors suggested that the plant was a recent arrival on the Bountys; until 2004 the Bounty Islands were thought to be devoid of any vascular plants. They recorded "at least 13" plants, at two sites.

A recent, or maybe not-so-recent, arrival of perhaps one seed might be expected to show only part of the variation of the gene pool of the whole complex, and to me is no basis for erecting a new species. But I will keep an open mind. It would be nice to know whether *L. seditiosum* could interbreed freely with other segregates if they were brought together.

Interestingly, Allan in 1961 had suggested that much further study was needed to resolve the variation that had been observed throughout the range of Cook's scurvy grass. Later, David Given (1981) thought that such a study might be impossible by then because so many critical populations had been lost. But the authors of the 2013 paper argue that sufficient populations remain to allow their taxonomic revision. I'm not so sure.

- **Wahlenbergia**

A species of harebell (*Wahlenbergia akaroa*), described and named by Judith Pettersen (Pettersen 1997), is another possible contender for Banks Peninsula endemic status (Fig. 2, page 70). But I think it is better regarded as just a coastal form of the widespread *Wahlenbergia gracilis*. *Wahlenbergia akaroa* has firm, rather fleshy leaves and large blue or white flowers, but it merges through intermediate forms with the abundant,

highly variable harebells of open grassland, shrubland and banks further from the sea. Recent work by Wellington-based botanists (Prebble et al. 2012) tends to support this view.



**Figure 2** Harebells *Wahlenbergia gracilis* and *W. akaroa*. Refer to text for commentary. Original drawing by the author.

- **I hesitate**

There may be arguments for separating *Pilosella* from the rest of *Hieracium*, but I prefer to regard these two as subgenera, not genera.



Volume 4 of *The Flora of New Zealand* (Webb et al. 1988) concluded: "*Hieracium* may be neatly divided into several subgenera, although arguments for accepting these at generic rank are not at all convincing."

I had to ask myself "Are there really good grounds for separating *Austroderia* (our native toetoe species) from *Cortaderia* (South American pampas grasses, some of them naturalised in New Zealand)"? I keep them all in *Cortaderia* until I can assess the evidence more carefully. Publishing *Austroderia* at subgeneric rank would have avoided changes to the long-established binomials.

I doubt if anyone is entirely happy with such a large and unruly genus as *Senecio* (a Linnaean name). Treating many New Zealand species formerly placed in *Senecio* within a revised concept of *Brachyglottis* seems now to be widely accepted, and I willingly fall in line. I find it harder to accept the segregate genus *Jacobaea*. Banks Peninsula has three naturalised species recently transferred into this genus. I am continuing to use the names *Senecio jacobaea* for ragwort, *S. elegans* for the South African purple groundsel, and *S. cineraria*, for dusty miller, until I understand the reasons for the suggested split better. (Incidentally, garden cinerarias seem to be currently, although perhaps only temporarily, called *Pericallis xhybrida*, having tried out *Senecio* and *Cineraria*, the latter also a Linnaean name.)

The sporadic and piecemeal dismemberment of *Senecio* is messy. How good a thorough assessment of the whole genus would be, but it is a big ask. Even with the shearing off of numerous "satellite" genera, *Senecio* is still one of the largest genera of seed plants with around 1000 species and uncertain limits.

Thus for the time being I keep calling German ivy *Senecio mikanioides* rather than *Delairea odorata*. But I am probably not being very consistent as I have taken on board the name *Kleinia serpens* for a succulent earlier included in *Senecio*.

- **I concur**

Some recent name changes make sense to me. I am completely happy to sink *Macropiper* into *Piper* (Fig. 3, page 72), and *Pratia* into *Lobelia*. I accept now that *Tetragonia trigyna* seems to be the same as *T. implexicoma*. The genus *Lycopersicon* never seemed necessary, and I now call the tomato *Solanum lycopersicum* as I imagine most other people do. ("You say tomato, and I say tomato." Great!) I have some residual doubt about sinking *Oreomyrrhis* into the otherwise Northern Hemisphere chervils (*Chaerophyllum*), but I have acquiesced. The December 2012 account that places New Zealand grammitid ferns into the new southern genus *Notogrammitis* is convincing, and I follow it (Perrie & Parris 2012). Equally convincing are arguments about *Ficinia* (Muasya & de Lange 2010), even though farewelling the New Zealand endemic monotypic genus *Desmoschoenus* is a bit sad! I now happily use the names *Ficinia spiralis* for pīngao, and *Ficinia nodosa* for the coastal club rush.



**Figure 3** Kawakawa (*Piper excelsum*). Original drawing by the author.

So what have I been trying to say? Name changes are an inevitable part of increasing knowledge about plants. It's necessary to accept many of them as part of the journey. But taxonomy is not a search for absolute truth; it's a very human attempt to make as much sense as possible of an almost impossibly complex and messy world. That means a considerable amount of flexibility and compromise is not only acceptable, it can also be very helpful in efforts to make our naming system more stable, without sacrificing its amazing ability to clarify phylogeny. Botanical names are in for a stormy ride over the next

few decades. It would be helpful to have a boat which could ride the waves a little more smoothly.

### Acknowledgements

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**Table 1:** A random selection of plants wild on Banks Peninsula that have enjoyed names of unswerving constancy.

| <b>Botanical name</b>             | <b>Vernacular name</b>        |
|-----------------------------------|-------------------------------|
| <i>Alectryon excelsus</i>         | tītoki                        |
| <i>Carpodetus serratus</i>        | putaputāwētā                  |
| <i>Coprosma lucida</i>            | karamū                        |
| <i>Coprosma propinqua</i>         | mikimiki                      |
| <i>Coprosma rhamnoides</i>        | mikimiki                      |
| <i>Coprosma robusta</i>           | karamū                        |
| <i>Corokia cotoneaster</i>        | corokia                       |
| <i>Corynocarpus laevigatus</i>    | karaka                        |
| <i>Dichondra repens</i>           | -                             |
| <i>Elaeocarpus hookerianus</i>    | pōkākā                        |
| <i>Gunnera monoica</i>            | -                             |
| <i>Leptospermum scoparium</i>     | mānuka                        |
| <i>Linum monogynum</i>            | rauhuia                       |
| <i>Melicytus ramiflorus</i>       | māhoe                         |
| <i>Mimulus repens</i>             | purple musk                   |
| <i>Myoporum laetum</i>            | ngaio                         |
| <i>Parsonsia heterophylla</i>     | New Zealand jasmine, akakiore |
| <i>Pennantia corymbosa</i>        | kaikōmako                     |
| <i>Pittosporum obcordatum</i>     | heart-leaved kōhūhū           |
| <i>Plagianthus divaricatus</i>    | salt-marsh ribbonwood         |
| <i>Podocarpus totara</i>          | tōtara                        |
| <i>Raoulia glabra</i>             | -                             |
| <i>Raoulia subsericea</i>         | -                             |
| <i>Rosa canina</i>                | dog rose                      |
| <i>Rosa rubiginosa</i> *          | sweet briar                   |
| <i>Solanum aviculare</i>          | poroporo                      |
| <i>Solanum laciniatum</i>         | poroporo                      |
| <i>Teucrium parvifolium</i>       | -                             |
| <i>Urtica ferox</i>               | ongaonga, bush nettle         |
| <i>Wahlenbergia albomarginata</i> | harebell                      |

\* though of course a rose by any other name would smell as sweet!