

Taxonomic problems

by James Cobb

(James Cobb very kindly prepared his lecture for publication)

“Having been rescued by the incomparable Scottish tertiary education system - I intended to read Botany. After two years of largely rote learning taxonomy I chose Honours in Zoology in the exciting department headed by Prof H.G. Callan – newly made FRS. I did in the end teach Botany at St. Andrews in the combined Biology Department. Taxonomy is unquestionably essential to provide an unequivocal identity to any organism. How useful doing this in Latin is a moot point – bad enough in some ways that scientists almost universally have to write in English if they want anything but a local audience. All most scientists require is a name for the organism on which they are working – usually a Genus and then a Species. These are written in Latin and in text this is indicated by italics. Taxonomists however regard it as their own branch of science and are interested in relationships and evolution. As science advances, new techniques provide new ways of testing relationships and thus taxonomy becomes more fluid. This produces a conflict between scientists who want an unequivocal and reliable naming system and taxonomists. Recent taxonomic changes do make things difficult in the Genus *Meconopsis*.

I must acknowledge a great deal of kind help from people; in particular Margaret Thorne who has gone to great lengths to ensure I am sent images from the wild. There are superb pictures from Harry Jans, Martin Walsh, John Mitchell, Finn Haugli and Hilary Birks among others. Prof. David Rankin has very much shared his knowledge of *Meconopsis* in Yunnan and included me in the discussions of the *M. wilsoni* related plants he found there. Paul Egan too has greatly helped me with his particular knowledge of the evergreen monocarpics and has emphasised the conservation aspects of *Meconopsis* in the wild. Alan Elliott has been wonderful in his help with herbarium materials and keeping me updated on recent taxonomic work.

Paul Egan has drawn attention to the risks to some of these plants as countries in that region continue development - an obvious one to me is the beautiful but very localized *M. delavayi* in Yunnan. Finn Haugli in particular has shown that this is very growable in northern Norway and other Norwegian growers grow other species that are difficult in the U.K. and I think we need to think seriously about whether we grow these plants just for pleasure or whether there should be more serious aims.

This is a proposal to add to the group website an identification guide which is not based on a classical key but is arranged by closely related groups and uses multiple images of all relevant features for each taxa.

In short the aim is not to challenge classical taxonomy but to provide a user friendly alternative making use of the huge advantages of digital photography.

Chris Grey-Wilson is close to producing a new monograph on the genus and has already published some parts of it. There are areas where I would find myself in disagreement and I shall discuss one of these. There is no doubt that people in Scotland find it easier to grow this genus and although garden plants are no substitute for studying in the field, nevertheless a deep garden knowledge has much value. It is however necessary to be aware that behaviour in the garden may be different to that in the wild. I use *M. punicea* as an example; of many thousands I have grown, some look as though they will be perennial but not one ever has been. I am growing on plants of a perennial form but is this species perennial in the wild? A second example comes from Lingham. In 2009 I grew on 50 plants for a seed producing bed in Caithness. I kept 5 here in Fife. All 5 of mine flowered this year, set little seed and I suspect they will not be there next year! In Caithness all 45 are now robust multirosetted plants and not one made any attempt to flower. In the same way several forms of *M. grandis* are reliably perennial there.

I did take exception to the recent split of *M. betonicifolia* back into *M. baileyi*. The Yunnan form is now *M. betonicifolia* and the Tibet plants have been put into *M. baileyi*. Chris Grey-Wilson published this in the AGS Journal, which he edits, and lists 9 characters. Six of these relate to foliage differences which have little significance. The remaining 3 are smooth seed pods, a stoloniferous habit and a lack of a false whorl at the top of the flowering stem in the Yunnan plants. The false whorl has no validity – even on the Mec Group website this is clearly a variable feature as it is in many of the garden and wild collected plants I have grown. The stoloniferous habit also occurs in the Tibet form but perhaps not so markedly. This raises the question as to why these two populations are such a distance apart geographically. *Meconopsis* are extra-ordinary plants in that they grow to large size and produce masses of large seeds at high altitudes. The seeds have both value as a medicine and also as a source of seed oil. The Yunnan population is close to a very old trade route into China and it seems to me entirely likely that easy to propagate plants might have been moved there at some time over the last 3 millennia. The smooth capsules on some plants also troubled Taylor in his monograph but even if this character is valid, it simply does not seem a significant enough feature to split a species.

Slightly off the subject of this talk is the enigma of cream and deep blue *Meconopsis discigera* in quite separate parts of the Himalayas. Species with blue and yellow flowers are almost non-existent; only an old

report of a yellow *horridula*, the exception. The blue *discigera* from Bhutan have 5 lobed leaves and the yellow form from more westerly Himalayas has 3. I did wonder if at some time in the long distant past that the blue *discigera* hybridised with *M. integrifolia*. I am assured by professional ex colleagues that speciation by hybridisation is an accepted phenomenon. Note also the extremely local *M. florindae* which is really a cream/yellow *M. lyrata*

A group that really needs attention is the purple flowered, largely deciduous monocarpics centred round *M. lancifolia*. All these are difficult in the UK and just how many species there are remains to be seen. One must acknowledge here that these are all Chinese species and that they have many professional botanists working on *Meconopsis*. It must be a little galling to have to stick with names that commemorate foreigners and I do feel that calling the new *Discogyne* species *M. tibetica* was a bit tactless. I know a number of colleagues have good contacts and relationships with Chinese professionals and it would be nice to have their help without them thinking we are trying to take over.

The next group is the 'blue' evergreen monocarpics based around *M. wallichii*. This last species Taylor lumped into *M. napaulensis* - that makes no sense. David Rankin has much expertise on this group of plants and I would hope that he would lead on this collection which includes the new *M. wilsoni* as well as *M. violaceae*.

Paul Egan has talked to the Mec group on the non 'blue' evergreen monocarpics. These are mostly Himalayan and not Chinese and include classics such as *M. paniculata*, *M. superba*, *regia*, *dhowjii*, *gracilipes* as well as *napaulensis* itself and some other more localised species. Neither Chris Grey-Wilson or I really understand the key character of Taylor's with *M. paniculata* of a substellate pubescence and this species is clearly widespread, variable and may merge into the likes of *longipetiolata* and *robusta*. It would be useful if Paul could be persuaded to lead a group looking into this cluster of species.

Chris Grey-Wilson split *M. integrifolia* back into this plus *M. pseudointegrifolia*. The latter with simple leaf venation, a long style and a drooping cream flower is quite distinctive from the brilliant yellow, upright flower of *integrifolia* with no style at all and a three veined leaf. The leaf venation is simply too varied to use as a character and strong midrib and sometimes 2 strong side ribs is almost certainly an adaptation to height and exposure. The long style and drooping flowers may well be an adaptation to wetter climates. Certainly the distribution map in Grey-Wilson's paper in Curtis Botanical magazine shows *integrifolia* in drier regions. A website showing the two extremes but all the variation in between would help people understand the evolution – apparently ongoing – of these two extremes.

The final group is *M. horridula* relatives. *M. horridula* is now reserved for the high altitude taxa. Within the same supergroup are *M. racemosa*, *prattii*, *prainiana*, *pseudohorridula*, *quinghaiensis*, *rudis*, *bijangensis*, *castanea* and Yoshida has apparently two more in the pipeline of publication. Once again Taylor was aware of this variation, although a number are from areas newly explored since he wrote. The scapose nature of the high altitude types *horridula* and *quinghaiensis* for example is almost certainly the altitude effect, as probably the upward facing flowers of *quinghaiensis* are due to a drier local climate as we have seen with *M. integrifolia*. It seems clear to me that *M. horridula* turns into *M. racemosa* as you come down the mountain via plants that have agglutinosed flowering stems. I am assured that both *M. prattii* and *M. rudis* have been found scapose at higher altitudes and others of this group show a mix of scapose flowers with a raceme. They are clearly a group still actively evolving. As far as I can see, during the ice ages the Himalayas were not covered by a thick ice sheet but probably the ice just descended down the mountains during global cooling but the bottoms of the valley would have remained temperate and perhaps plants just retreated down hill for just a few miles or even less. The ice ages came and went about a dozen times over 1.5 million years, some longer lasting than others, with warmer interludes. Populations may have become isolated in this way and then perhaps during the warming were re-united. During the isolation they may well have substantially evolved new characteristics but much more work needs to be done to find out if that isolation led to new species that are sterile when crossed with their ancestors and other closely related taxa. Certainly the very distinctive *M. rudis* which appears to inhabit more open screes and higher altitudes produces many intermediaries with *prattii* which occupies lower grassy levels.

The aim therefore is not to challenge new taxonomy but to provide a website that shows as many characters as it can with digital images - from seedling images, flowers and foliage to seed pods and seeds (and also if possible herbarium materials). This will create a multi-author archive that is centred on a much more easily used identification system than a classical key. (It might be a good idea to apply this to the large collection of big blue poppies that Evelyn manages). The website would be important for the serious tourist as an identification guide, allow the conservation status of plants to be assessed and also perhaps help professional taxonomists place new material, especially in relation to areas where as individuals they may not have access to either herbarium materials or for political reasons to the geographical region.”