New Findings on *Meconopsis* from Nepal
by Paul Egan

Overview

The talk entailed 3 main topics related to recent research into *Meconopsis* of Nepal, both from field and herbarium studies. These topics included an advanced preview of two new species, an investigation into the distribution of some little known *Meconopsis* of Nepal, and a brief examination of morphological diversity within several species.

1. Preview of two new species

Two new species of *Meconopsis* will be described later this year. These new additions to the genus will fit into the series Robustae (*MM. napaulensis*, *paniculata* etc.) and the series Discogyne (*M. discigera* etc.), and are based on findings made from field and herbarium studies respectively. Taxonomic descriptions and further elaboration will be presented in the formal publication. A special emphasis will be placed upon quantitative analyses, which can offer a much more objective approach to taxonomic classification (so called numerical taxonomy), with the added advantage of statistical validation.

The first new species was encountered during field studies in northern central Nepal, where research was conducted in the Ganesh Himal, a remote area not well documented botanically. The area was first seriously explored by Stainton in 1962, and more recently the first floristic inventory of the region undertaken by Japanese botanists (Miyamoto et al.) in 1994. The discovery of a new species from this area is in striking accord to observations made by Stainton while collecting here. However, as detailed during the talk, not all points were in agreement, while no mention is given to some of the most important discriminating features of the plant which we have observed. However, for a field botanist on a collecting expedition, the standard of such detailed observations and notes must be commended.

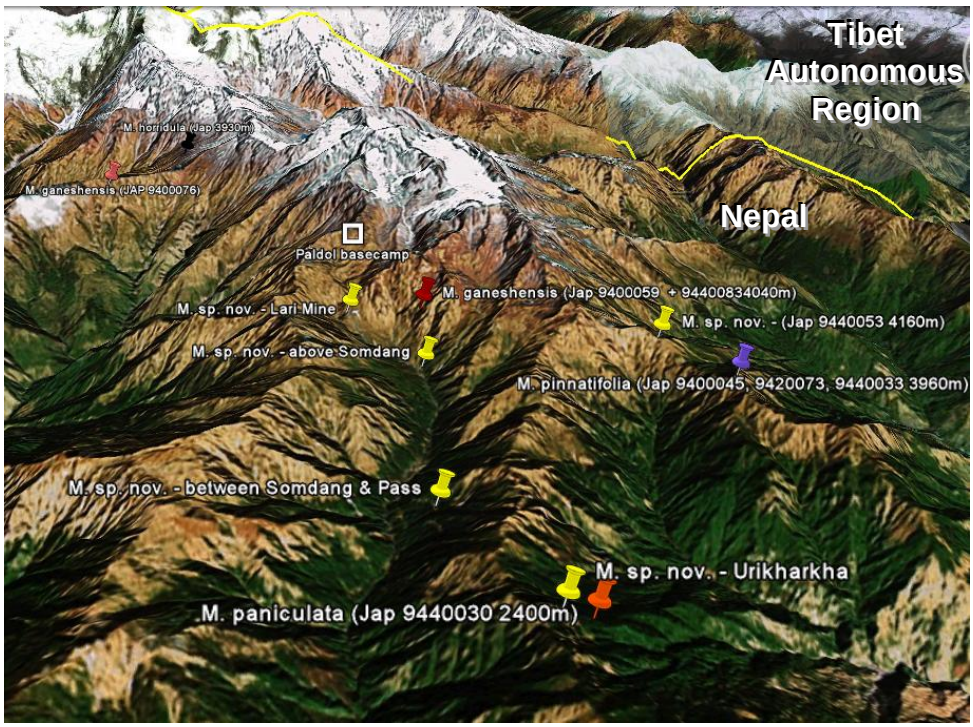


Figure View of the Ganesh Himal, C Nepal, looking north. Specimen records of various species are noted, along with observations of populations of *Meconopsis* sp. nov (yellow pins). A point of overlap between populations of the new species and *M. paniculata* can be observed in the foreground of the image. Re-determination of Japanese held specimens has also revealed populations of *M. pinnatifolia*.

The new species clearly belongs to series Robustae, which is typified by monocarpic perennial plants with usually large overwintering rosettes. Its relatively tall stature, along with pale yellow flowers, immediately places it in close relation to *M. paniculata*. However, several clear differences in morphology and ecology are evident in the taxon, which undoubtedly justify classification at the species level. These include differences in stigma size and colour, plant height and inflorescence, as well as several other characters.

Significantly, the new species and *M. paniculata* are predominantly non-overlapping in their flowering periods. *Meconopsis paniculata* is a much earlier flowering species; the upper fruit capsules already completely ripe with seed by the time blooming is under way in the new species. This difference thus serves to maintain genetic isolation between the two. In this fashion, it was observed that morphological integrity was upheld even in populations found in close proximity. This fact is especially interesting when one considers the propensity of *Meconopsis* to form natural hybrids in the wild.

The second new species qualifies as a member of the series Discogyne as discerned by the characteristic presence of a disc-like structure surmounting the ovary, which is present in all species. When taking a deconstructive approach to determination we can quickly narrow down possibilities (that is, eliminate potential species until arriving at a sole candidate). In this instance we can start off by eliminating species of the series Discogyne with blue or yellow flowers (e.g. *M. discigera*, *M. simikotensis* etc.). On strict geographical grounds we can eliminate species not found from central Nepal, leaving us with one prospective candidate: *Meconopsis pinnatifolia*. The presence in the second new species of (A.) entire, as opposed to pinnatly cleft leaves, and (B.) dark red, as opposed to purple flowers, indicate a strong disparity with *M. pinnatifolia*. Although isolated by a considerate geographical distance (some 260km), the second new species in fact seems to be more closely related to *M. tibetica*, which is found just northwest of Everest, on the Chinese/Tibetan side of the frontier. However, one particularly unique feature which can immediately differentiate the new species from all other members of the Discogyne is the occurrence of multiple stems per plant, as opposed to one central fleshy stem.

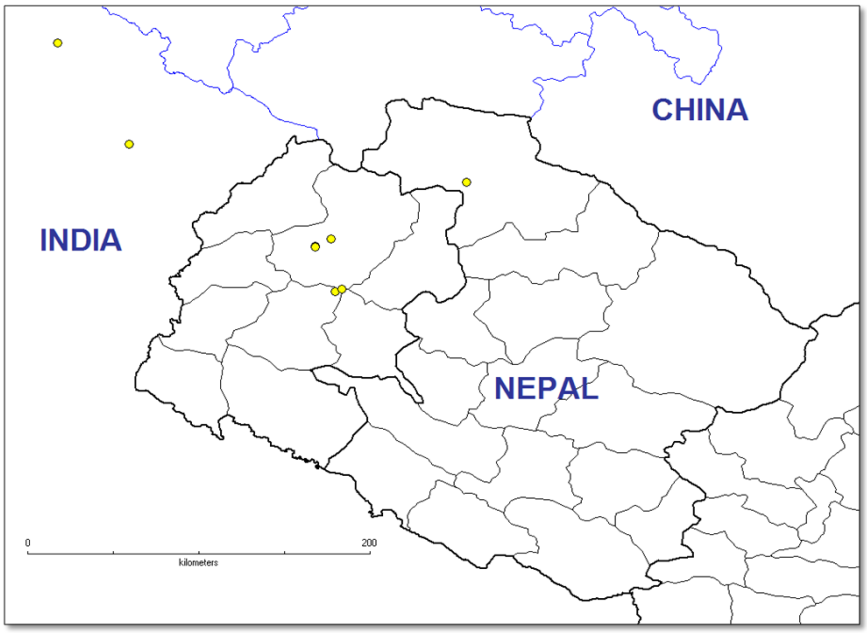
2. Distribution

A comprehensive listing of the occurrence of *Meconopsis* in Nepal, on a per district basis, will appear in the Flora of Nepal. The Flora sets out to produce a unique approach to specimen-based Flora writing, producing a new style 'online Flora' making full use of developments in information technology:

> ‘Underpinning the printed Flora will be an Internet accessible electronic resource containing more detailed specialist data (e.g. full nomenclatural references and typification), distribution maps generated from cited specimens, images, etc. Much of this additional information is normally recorded as part of the Flora process, but usually lost to a wider audience’.

During preparation of the account a number of novel findings were made regarding the distribution of several species. Two of the main findings which were discussed during the talk were affirmation as to the occurrence of *M. robusta* from western Nepal, and new records of *M. pinnatifolia*, significantly extending its range westwards into the Gorkha Himal of central Nepal. Both these findings have stemmed from examination of new field collections made by the Flora of Nepal team. These collections have proven particularly invaluable in having been acquired from relatively little known regions of the country during frequent expeditions undertaken throughout the last circa 8 years.

Figure Updated distribution of *M. robusta* (left), and a recently collected specimen from W Nepal (right).



3. Morphology

A photographic account of morphological variation, as studied in the field, was presented in the concluding section of the talk. Both *Meconopsis horridula* and *Meconopsis napaulensis* were studied in depth from many diverse and geographically distant populations encountered in the wild. From such critical examination (a total of over 3000 quantitative measurements were recorded), a clearer picture of the range of variation in key morphological traits has been drawn. This has included such features as plant height, leave length etc. Indeed this information was seen to be highly relevant from a taxonomic viewpoint, and has thus been integrated, where appropriate, into the Flora account of *Meconopsis*. A complete detailed analysis will also feature in the forthcoming new species paper.

Figure Demonstration of intrapopulational variance in mature plants of *M. napaulensis* (left), and *M. horridula* (below). Despite the differences in stem height, flower width is seen to remain quite constant in *M. napaulensis*. Note that both scapose and racemose forms of *M. horridula* are observed from this high altitude population.

As well as from the field, new findings have been made from herbarium studies, the most noteworthy of which are in relation to *M. simikotensis*. Examination of newly collected specimens from W Nepal has enabled elaboration on the taxonomic description of the species for the Flora of Nepal, and thus a more extensive degree of variation has been appreciated in features such as fruit, leaf lobing, stigma colour and petal/flower shape. Owing to these new collections, the geographic range of the species has also been expanded. This is particularly important due to possible conservational threat in relation to limited distribution and/or low population numbers.

Selected references

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