

# Introducing two newly described species of *Meconopsis* by Paul Egan

## Overview

The talk centred around three parts - 1. a detailed introduction to the two new species, 2. a short discussion in regards to how the species may have come about in an evolutionary sense, and 3. a brief preview of work currently on-going on *Meconopsis*. The Phytotaxa publication contains the original species descriptions, excellent line drawings (by botanical artist and Group member Sharon Bradley), and additional notes on ecology and evolution, and can be freely downloaded:

Egan, P.A. (2011) *Meconopsis autumnalis* and *M. manasluensis* (Papaveraceae), two new species of Himalayan poppy endemic to central Nepal with sympatric congeners. Phytotaxa 20: 47–56. <http://www.mapress.com/phytotaxa/content/2011/f/pt00020p056.pdf>

The talk formed a continuation of a previous presentation from March 6<sup>th</sup> 2010 entitled 'New Findings on *Meconopsis* from Nepal', in which an advanced preview was given of the two new species while their scientific publication was still in preparation. Although the previous talk from 2010 contained additional topics besides, this 2011 talk should be considered to supersede previous preliminary information on the new species which had been presented.

## 1. New Species

The two new species of *Meconopsis* which have recently been described are *M. autumnalis* P.A.Egan, which fits into the series Robustae (*MM. napaulensis*, *paniculata* etc.), and *M. manasluensis* P.A.Egan belonging to subgenus *Discogyne*, and are based on findings made from field and herbarium studies respectively. The Robustae and *Discogyne* were revised by Grey-Wilson in 2006, and an updated key to the Nepalese species of *Meconopsis* will be presented in Volume 3 of the Flora of Nepal (Egan & Shrestha in press).

*Meconopsis autumnalis* was encountered during field studies in northern central Nepal, where research was conducted in the Ganesh Himal, a remote area not well documented botanically. Specimens of *M. autumnalis* had twice previously been collected, by infamous plant hunter J.D.A. Stainton on his 1962 expedition with S.A. Bowes Lyon to central Nepal, the more recently on the first floristic inventory of the region on the Flora of Ganesh Himal expedition undertaken by the University of Tokyo/Department of Plant Resources, Nepal, in 1994. The discovery of a new species from this area is in striking accord to observations made by Stainton while collecting here. The field notes for Stainton 4028 separate *M. paniculata* from what was noted as a second 'easily distinguishable' species of *Meconopsis* subsequently collected in the Ganesh Himal, and, when growing together, 'no intermediate forms were seen'. 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 was observed during my own fieldwork in 2008. *Meconopsis autumnalis* 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 (as additionally verified by a forthcoming 'morphometrics' study on some Robustae series species). These include differences in stigma size and colour, plant height and inflorescence, as well as several other characters further discussed in the paper.

The second new species, *Meconopsis manasluensis* was first collected as part of the joint Flora of Nepal Edinburgh/Tokyo Manaslu '08 expedition to the Manaslu region in 2008. The species qualifies as a member of subgenus *Discogyne* as discerned by the characteristic presence of a disc-like structure surmounting the ovary. The presence of (A.) entire, as opposed to pinnately cleft leaves, and (B.) dark red, as opposed to purple flowers, indicate a strong disparity with *M. pinnatifolia* which is a closely related species also found in the same locality. Although isolated by a considerable geographical distance (some 260km), *M. manasluensis* 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. Speciation

Significantly, *M. autumnalis* 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 occurrence of new species coming into existence in the absence of the barrier of geographic distance to encourage 'evolutionary divergence' is known as sympatric speciation. In this instance, it is hypothesized that the formation of different flowering periods may have kick-started the divergence between the species, eventually resulting in reproductive isolation, though still remaining predominantly overlapping in distribution. It is unclear by what mechanisms sympatric populations of *M. pinnatifolia* and *M. manasluensis* are reproductively isolated and further investigations will be required to clarify this. The published paper contains a much more extensive discussion on the topic of speciation.

## 3. Future

A brief mention was given on some future work forthcoming or currently in production, which includes:

- Publication of Volume 3 of the Flora of Nepal - set for Autumn 2011, within which the account of *Meconopsis* and *Cathcartia* is to appear. As listed more in-depth in the talk notes of 'New Findings on *Meconopsis* from Nepal', 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).
- Morphometrics & genetics study - this study will focus on a selection of Robustae series species and examine the differentiation between them employing methods from the fields of numerical taxonomy and phylogenetics.

## Selected references

- Egan P.A. (2010). Expedition *Meconopsis*. The Rock Garden,124: 46–61.
- Egan, P.A. (2011) *Meconopsis autumnalis* and *M. manasluensis* (Papaveraceae), two new species of Himalayan poppy endemic to central Nepal with sympatric congeners. *Phytotaxa* 20: 47–56.
- Egan, P.A. & Shrestha, S. (in press). Flora of Nepal, Vol. 3, Watson et al (eds), RBGE
- Grey-Wilson, C. (2006a) A new *Meconopsis* from Tibet. *Alpine Gardener* 74: 212–225.
- Grey-Wilson (2006). The true identity of *Meconopsis napaulensis* DC. *Curtis's Botanical Magazine*, 23, 176–209.
- Ikeda, H. & Watson, M.F. (2010) Plant collecting around Mt. Manaslu in 2008. *Newsletter of Himalayan Botany* 43: 11–13.
- Ohba & Ikeda (eds) (1999). A contribution to the Flora of Ganesh Himal, central Nepal, University Museum, University of Tokyo.
- Stainton (1965). Notes on journeys in East & Central Nepal 1964.