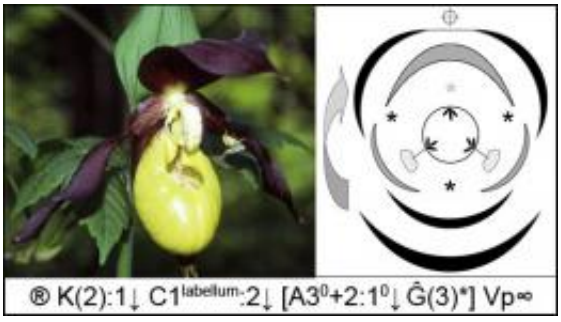
Revised floral formula, inflorescence terms

January 7 2011, By Dr. Gerhard Prenner



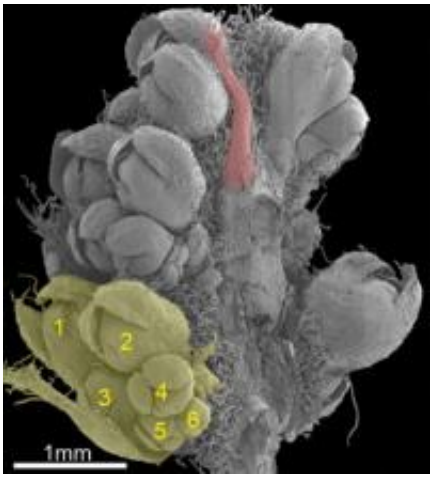
Cypripedium calceolus; a complex orchid flower, its diagram and its new floral formula Credit: G. Prenner

Research into the structure and development of flowers and inflorescences has revealed that traditional descriptive methods are often inadequate. Scientists at Kew have therefore suggested revisions to floral formula and inflorescence terminology.

The floral formula is a traditional method of efficiently summarising the structure of a flower in text using only letters, numbers and symbols. In a review in *Taxon*, Gerhard Prenner, Richard Bateman and Paula Rudall update the format and information content of floral formula.

The new flormula include the number and symmetry of each whorl of floral organs, position of the organs relative to each other, partial and/or complete fusion of organs, resupination, organ loss and suppression, and deviations from standard bisexuality. The authors use several complex

flowers to illustrate their view that formulae of all known flower morphs can be accurately represented using standard typeface and Unicode character codes.



Aesculus octandra has an indeterminate thyrsoid inflorescence. This SEM image shows the indeterminate apex (colored in red) and one monochasial cyme (in yellow); flowers are numbered according to their sequence of initiation. Credit: G. Prenner

It is recommend that floral formula become a routine component of diagnoses in protologues and other formal taxonomic (re)descriptions, functioning as a logical phenotypic counterpart to the DNA barcode.

The iterative structure of inflorescences makes them suitable subjects for constructing models to account for morphological variation. However, the terminology surrounding inflorescence architecture suffers from radically divergent definitions of terms that reduce the value of some recent predictive models.

In an 'Opinion' paper in *Trends in Plant Science*, Gerhard Prenner and

Paula Rudall, working with Francisco Vergara-Silva (UNAM Mexico), stress the key role of morphology in modelling inflorescence architecture. They argue in favour of uniform terminology and against over-simplification.

Recognising the value of bracts and prophylls as key markers of inflorescence architecture, their preferred terminology gives the main inflorescence types as cymose, racemose, paniculate and thyrsoid, although problematic 'special cases' such as highly reduced flowerlike inflorescences (pseudanthia) defy assignment to particular types.

More information: Prenner, G., et al. (2010). Floral formula updated for routine inclusion in formal taxonomic descriptions. *Taxon* 59: 241-250.
Prenner, G., et al. (2009). The key role of morphology in modelling inflorescence architecture. *Trends in Plant Science* 14: 302-309.

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