

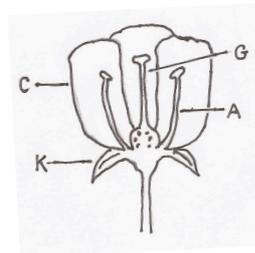
A FLORAL FORMULA

Gill Wragg

In September 2013, Christine Ffoulkes Jones of Hall Farm Nursery, Kinnerley, hosted a 'Botany Course for Gardeners' led by Mark Duffell of Arvensis Ecology.

It was a rare treat to join a practical seminar with no slides, just living plants, tweezers and magnification glasses. Our studio was held in the polytunnel; a varied group of gardeners all sharing the long table, while we rubbed shoulders and followed some basics from this complex science. As the rain beat down, armed only with an A4 white board, Mark introduced the principles of a 'perfect' flower specimen, naming the essential parts coded into the formula K C A G:

K= calyx, or sepals
 C = corolla, or petals
 A= androecium (male), or stamens
 G= gynoecium (female), or carpels



A print drawing of this 'perfect' flower was given out, to be annotated as everyone wrote in all the names of the major components. After initial instructions, everyone got busy handling and separating out the sections from fresh specimens taken from Christine and Nick Ffoulkes Jones' attractive plant stocks from their nursery.

Were the flowers actinomorphic? Radially symmetric (or regular) division means they can be divided in multiple ways. Or were they zygomorphic? Asymmetric (or irregular) division means they can only be bisected one way. At the start, it seemed an unfamiliar zone but, believe me, as each task was completed, confidence began to soar in our laboratory.

Each person has early memories of wild flower collecting or plant biology from their schooldays - I remember it was the buttercup in my class - or maybe more recent knowledge through adult learning. All I can say is that, from 10.30am to 4.30pm, we entered a micro world and became totally absorbed in discovering and learning about each flower type, stripping everything down to the bare essentials. What fun we had as naturalists.

Plant identification using the male/female/bisexual parts was learnt by gently pulling apart the sepals, petals, stamens and anthers to reveal the stigmas/seed capsules. All eyes were peeled to count the smallest fragments, handling the tweezers and using special eye glasses to calculate the formula for ourselves. Now I know why botanical artists display the collections of filaments, stamens and stigmas leaves/roots etc. the way they do. Magnification also revealed secret structures underlying and connecting to other components of buds or seed formations in the ovary or seed pod. Normally unseen, it gave us a great buzz to see the beautiful designs and colours revealed. At this late stage in the season, there were many varieties to compare at different stages of their growth cycle.

Breaks for coffee and lunch with presiding hostess, Christine, gave us even more chance for social interaction, inundating Mark, our patient lecturer, with further enquiries and general gardeners' chit chat. His enthusiasm and helpfulness kept us all busy and fully occupied whatever horticultural knowledge we had.

Some of the flowers and fruit we examined that day included fuchsia, daisy, diascia, sweet pea, crab apple, tomato, geranium, crocosmia and scabious. Collectively, we managed to perform numerous investigations which were both eye-opening and exciting.

Each plant family can be distinguished by agreed formulae. There are others, but the flower formula we were introduced to gave us the power to interpret, in some small way, the business of pollination /reproductive systems, or to simply mark the differences or similarities between them. Mark discussed each individual flower while we had a table swarming with escaped insects and samples, as each person attended to their own dissections. Shortly, Mark called out the correct formula, for example the dead nettle (Lamiaceae) which we had taken apart. This formula was K(5) C(5) A(4) G(2) so we all checked our own collected plant material to find if we had been able to fathom the mysteries and match it. It was fascinating to handle and break up the very plants as Mark simultaneously supplied detailed information into their history. By the end of the day, multiple plant families had been analysed and configured. It was amazing that we all started to recognise and achieve complete results. This was a revelation.

Discovery by doing, using all your senses, began to make recognisable patterns on the table top. As people recorded their findings, there was still time to admire the twin stigmas with a calyx revealing two pairs of seeds arranged in a hot cross bun formation in the dead nettle, or the fused stigmas of the mallow flower in a starfish pattern. Then it was on to the next flower sample, and the next, and the next. Everybody gained some insight into the character and private life of plants, which proved a stimulating day. A pamphlet recording 18 floral family groups, complete with beautiful diagrammatic pictures/notes and cross-sections of flower proforma, was given out. I am sure this will enhance our appreciation of all the inhabitants of our gardens when we ask them 'who are you?'.

PS: As a direct result, I am now enjoying studying *The Naming of Names - the Search for Order in the World of Plants* by Anna Pavord (Bloomsbury Press, 2005).

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