PLANT NAMES

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COMMON NAMES

Bluebell is an example of a common plant name. In Scotland you are talking about *Campanula rotundifolia*, in Ireland you mean *Hyacinthoides non-scripta* (but you used to mean *Endymion non-scripta*), in America you mean a *Mertensia* species, in Australia a climber called *Sollya heterophylla*, but you might also mean a *Wahlenbergia* species, especially if you are in S. Africa or New Zealand. Common names are fine in the right place, but are never much use internationally. [Thus **Lus mór** - 'big herb' is not much use unless you know it is in a particular Irish context.]

Within Great Britain and Ireland we have a long history of contact with European languages, and these have sometimes affected our plant names. A good example is the **Ilex tree** or **Holm oak** (*Quercus ilex*). Ilex was the Roman name for the Holm Oak. However in Linnaeus' day (1707–1778) some scholars believed it applied to the Holly tree, and therefore Linnaeus christened the Holly with the Latin name *Ilex*. Holm is the Old English name for Holly, and likewise this has now been transferred to *Q. ilex*. Thus the Roman name for *Q. ilex* has been transferred to Holly, while the Old English name for Holly has been transferred to *Q. ilex*!

Similar errors have occurred to the name of one of our most familiar weeds the **Dandelion** (*Taraxacum officinale*). The name probably derives from *Dent de Lion* – French for Tooth of the Lion. Possibly the name came with the Normans. However, in France the 'Dent de Lion' is a *Leontodon* (which we would know as a Hawkbit !) and instead they give the name *Pisenlit* to *Taraxacum* – literally wet-the-bed because of its powerful diuretic properties[1]. Linnaeus correctly ascribed the name Leontodon (*Tooth of the Lion* in Latin) to the Hawkbit and the Latin name (derived from a Persian name!) to *Taraxacum*.

Corruption of familiar words can not only occur across language divides, but also within them. **Foxglove** would appear to any English-speaker as being something to do with foxes and gloves. But in fact it is derived from Folk's Gloves, i.e. the gloves of fairies or the little-folk. The Latin name *Digitalis* means 'of the finger' and is derived from the German name of *Fingerhut* (lit. Finger Hat or Thimble) for the plant.

These examples illustrate some of the pitfalls of using common names. Scientific naming, or binomial nomenclature was devised to provide an

1 Dandelion is an important medicinal herb, and this is reflected in its name *Taraxacum officinale* - the 'offinarum' is the Roman name for a Pharmacy.

international system of plant and animal names so that the same groups carry the same names in all languages. If every supermarket and shop sold the same biscuits or breakfast cereals using different names, there would be no end of confusion.

SCIENTIFIC (LATIN) NAMES

All living things that have been named by biologists have a Scientific name. This name adheres to a rigid formula, comprising 3 parts. The first two parts are in Latin. The last part of the name (which is often omitted in non-technical documents or books) is the name of the author, literally the person who devised the name.

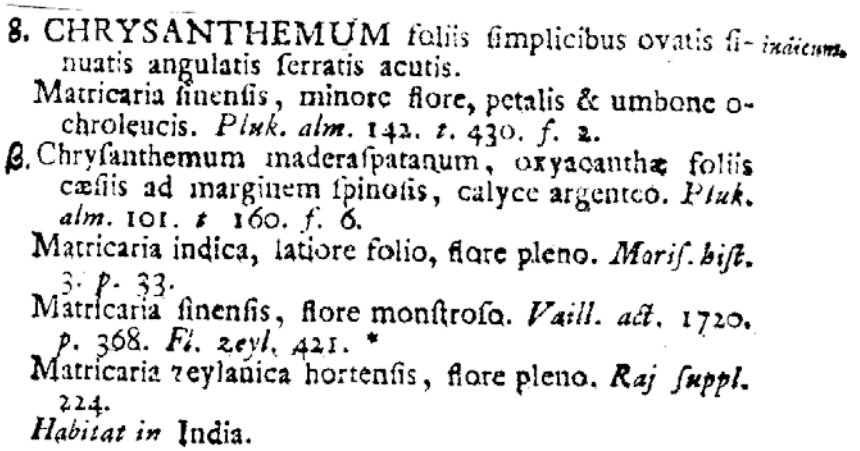
For example the lowland Oak species throughout most of Europe is ***Quercus robur*** **L.** *Quercus* is the genus name for the group of plants commonly known as oaks. The specific epithet is *robur*, Latin for strong, and is descriptive of the strength of the timber. The authority is L., an abbreviation for Linnaeus, who first coined the binomial name for this plant. The **species name** is *Quercus robur*, not *robur* on its own.

SOME RULES: The genus name always starts with a capital letter. The specific epithet always starts with a small case letter. In the past, species named after people often had a capitalised first letter, such as *Lilium Henryi*, however, according to modern usage this is incorrect. Lastly, scientific names must be written in italics, or underlined to distinguish them from surrounding text. The terms, cacti, narcissi, gladioli are not correct unless clearly written as 'English' words, i.e. never in italics and without a capital letter. Once a genus name has been used in a piece of text, then it is perfectly legitimate to refer to it with an initial alone, thus there will be no doubt that *Q. robur* refers to the *Quercus* mentioned at the start of this section.

There are numerous rules (see the section on the Botanical code) about the correct name, but basically these boil down to just two:

- It must be the earliest published after 1st May 1753,
- It must be correctly published, with a Latin name and briefly described in Latin, so as to distinguish it from other species. The publication must also be widely available.

The date of 1st May 1753 is the date on which the Swedish naturalist Carl Linnaeus published his ***Species Plantarum***. This book was revolutionary for two reasons. Firstly it introduced the idea of binomial nomenclature (lit. two-name naming) and secondly it was the first attempt to cross-reference all names used in botanical literature. An example would be the garden chrysanthemum, known at the time under at least five different names, each of which comprised a brief sentence that gave its salient, distinguishing characters. Linnaeus introduced the idea of what he called a trivial name, in the case of the garden chrysanthemum it was ***indicum***, because it was the only Indian species known at the time, this was a useful nickname (epithet) for the species. Linnaeus regarded the full sentence as the 'species name', in this case, the "chrysanthemum with simple ovate leaves with a sinuate margin of acute, angular serrations".


8. CHRYSANTHEMUM foliis ſimplicibus ovatis ſi- *indicum.*
nuatis angulatis ſerratis acutis.
Matricaria ſinenſis, minore flore, petalis & umbone o-
chroleucis. *Pluk. alm.* 142. *t.* 430. *f.* 2.
β. Chryſanthemum maderaſpatanum, oxyacanthæ foliis
cæſiis ad marginem ſpinoſis, calyce argenteo. *Pluk.*
alm. 101. *t* 160. *f.* 6.
Matricaria indica, latiore folio, flore pleno. *Moriſ. hiſt.*
3. *p.* 33.
Matricaria ſinenſis, flore monſtroſo. *Vaill. act.* 1720.
p. 368. *Fl. zeyl.* 421. *
Matricaria zeylanica hortenſis, flore pleno. *Raj ſuppl.*
224.
Habitat in India.

THE TAXONOMIC HIERARCHY

In the same way that species are grouped into genera, so individual genera are themselves grouped into **families**. In turn families are grouped into **orders** and then **classes**. For flowering plants there are some 250,000 recognised species, and these are divided amongst some 13,500 genera, 550 families, 83 orders, 11 subclasses, and 2 classes. This hierarchy makes it easier to catalogue things, and store information. Families, orders and classes must **not** be written in italics, but do start with a capital letter.

Species:…….. *Quercus robur*
Genus: …….. *Quercus* ……..…… with 600 species
Family: …….. Fagaceae …… with 7 genera
Order: ……..... Fagales ……..… with 3 families
Subclass: ……. Hamamelidae …… with 11 orders
Class: ……..….... Dicotyledons ….…… with 6 subclasses

FAMILIES

Closely related genera are grouped together into a family. Sometimes families have unique characters that make them easy to spot, for example Leguminosae (Fabaceae), the pea family, is characterised by having a pea pod. Other families are difficult to identify easily, such as Rosaceae, the rose family, which has very variable fruits including strawberries, blackberries, plums, apples, rosehips etc. There is no characteristic that tells the taxonomist what a genus, a family, order or class is, it is merely a rational human point of view to divide and catalogue the huge number of species. Today all family names have the ending **-aceae**. However there are 8 traditional family names which it is still legitimate to use, they are:

Traditional Name	Modern Name	
Compositae	Asteraceae	Daisy family
Cruciferae	Brassicaceae	Cabbage family
Gramineae	Poaceae	Grass family
Guttiferae	Clusiaceae	St.John's wort family
Labiatae	Lamiaceae	Mint family
Leguminosae	Fabaceae	Pea family
Palmae	Arecaceae	Palm family
Umbelliferae	Apiaceae	Carrot family

The reason the conformity to -aceae was established is to ensure that firstly a family name should be instantly recognisable, and secondly to ensure that there is a nomenclatural type (see the section on Type Specimens).

SPECIES, SUBSPECIES, VARIETIES AND FORMS.

A species is a population, or group of organisms that can interbreed with one another to produce fertile offspring that are to all intents and purposes similar to the parent population. There are numerous problems, such as **hybrids** (the result of a cross between two different species), **apomixis** (where seeds are produced automatically by a mother plant with no pollination – the offspring are a clone of the mother) or simply huge distances between populations, which makes it impossible for them ever to interbreed. Most species are fairly uniform, and that is why we can recognise them. However sometimes populations are somewhat different from the normal or widespread form of a species, and yet fundamentally they are the same thing. This variation is expressed by using various infra-specific categories.

Generally speaking a **subspecies** (abbreviated to **subsp**. or **ssp**. But **never spp**.[2]) represents some major change in appearance correlated with geographic position. For example, take Birch trees in the Himalayas. The white-barked species *Betula jacquemontii* grows in the Western Himalayas, whereas the darker-barked *Betula utilis* grows in the Chinese (Eastern-end) of the Himalayas. This works fine until collections from all along the Himalayas are compared, and it is found that one **taxon** (any taxonomic grouping of organisms, such as a genus, a species, a subspecies, a variety etc. plural **taxa**) literally merges into the other in the middle. Therefore *jacquemontii* was made a subspecies: *B. utilis* subsp. (or ssp.) *jacquemontii*. Automatically the darker-barked specimens become *B. utilis* subsp. *utilis*. It is also perfectly correct to refer to trees of this species as *B. utilis*, the subspecific epithet need only be used if you want to be particular about what form of the species you are talking about.

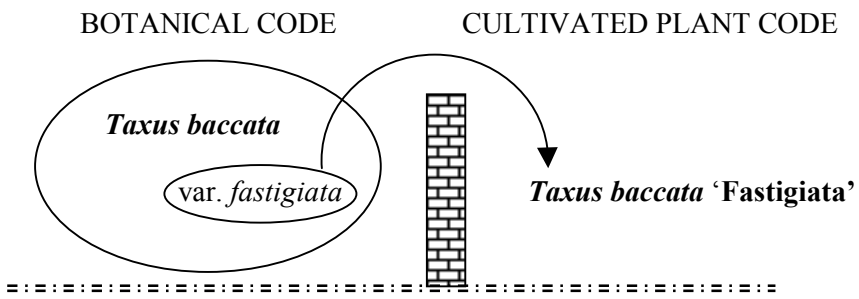
Sometimes such changes are neither as dramatic, nor associated with geography, but may be quirks of a particular population or habitat. In these cases the category of **variety** may be used, for example many plants have populations with dwarf forms (var. *nana*), while others may have coastal forms (var. *maritima*).

Forms (or **Formas**)are not often used today, but are generally applied to trivial differences in leaf or flower colours, i.e. *Cedrus atlantica* f. *glauca*. Often forms and varieties are no more than genetic variations that do not get inherited by all descendants. Thus the seedlings from a purple or copper beech, a weeping ash or a cut-leaved beech often have green leaves, an upright growth form or have normal leaves respectively. However there are no rules about when a infra-specific category is a subspecies, a variety or a form. It is even possible to have combinations of these, i.e. *Fagus sylvatica* var. *heterophylla* f. *laciniata*.

Historically cultivars were treated in exactly the same way, in that they were described in Latin, and written in italics. Thus the **Irish yew** was originally called *Taxus baccata* **var**. *fastigiata*. Later when it was realised that the single plant discovered on a County Fermanagh hillside (the second specimen died) were the only ones of their kind it was renamed as a cultivar: *Taxus baccata* **cv**. *fastigiata*. However today it should always be written thus: *Taxus baccata* 'Fastigiata'. The reasons for this are various, but basically it was decided that whilst the natural world was finite in terms of taxa (there are

2 The abbreviation spp. implies 2 or more species, i.e. Quercus spp. implies 2 or more Oak species.

250,000 species of flowering plants), the garden, farm or managed forest has infinite possibilities (there are 22,000 registered cultivars of Daffodils alone!) and the taxonomy of such cultivated forms should lie in the hands of the practitioner and not the professional taxonomist. To prevent a **var.** becoming muddled with a **subsp.** or **var.** or **f.** it was deemed best to separate the two nomenclatural systems. Wild taxa are the result of natural selection in nature, whilst cultivars are the product of human selection. The barrier between them is literally the Garden wall, the farmer's hedge or the forester's boundary:



Cultivar names are dealt with in detail later on.

WHAT DOES A TAXONOMIST DO (and WHY) ?

Taxonomy, systematics, classification and nomenclature are words which each have very specific meanings:

Taxonomy is the identification and naming of living organisms.

Systematics is the production of a classification system, and involves two steps in the following order:

1. **Classification** is the establishment and defining of groups of individuals or species, genera and even families (**taxon** pl. **taxa**)
2. **Nomenclature** is the allocation of a name to these groups.

When a plant **taxonomist** (Someone who identifies and names plants or animals) revises a group of plants, they proceed as follows. Let us assume that the investigation is being done on a genus. The taxonomist must first decide which plants belong to that genus (circumscription). This may require the investigation of members of related genera. Once the genus has been circumscribed, the next step is to decide how many infrageneric[3] taxa (species) are required. This is generally done at the species level although for some groups it may be necessary to designate infraspecific taxa (subspecies and varieties). As well as living plants, taxonomists regularly work with dried herbarium material, which have the advantage of preserving flowers and fruits out of season, and from anywhere in the world. All the individual specimens, whether living or dried, can be grouped into species, subspecies or whatever category is necessary. This part of taxonomy is known as **classification**.

Once the limits of the various species have been decided upon, descriptions can be prepared. Sometimes what was formerly regarded as a single species will be divided into two or more species, or what were previously regarded as two different species might be combined into a single variable species. When this happens how does the taxonomist decide which names to apply? This part of the process is known as **nomenclature**. Take for example a case where a single former species is now recognised as falling into two distinct taxa. Which of these taxa carries the old name and which one gets a new name ? This problem is solved by having **Type** specimens.

TYPE SPECIMENS

For every species of plant and animal there exists a **type specimen**. This specimen is neither a perfect example nor an average example of the species, but simply a **typical** member of it. When a species, subspecies or variety is first described, a dried herbarium specimen is selected as the type specimen. It is impossible to foresee how a taxon might be understood in the future. For example two species may be physically very similar but have completely different genetic systems that don't allow them to interbreed. In their outward appearance they may only differ in very small differences of their anthers, pollen grains, leaf hairiness etc. If we had to rely upon a description it might be that the originator of the name didn't discuss these features. However, because the taxonomist nominated a Type specimen this can be examined for the novel characters.

When an taxon (species, genus or family) is **divided** into two elements, the original name goes with the element represented by the type specimen. The type specimen of the former species must belong to one or other of these 2 species (determined by checking the new diagnostic character), and therefore the taxon without a name is readily determined. This ensures that a name is fixed to a particular species, and is not open to interpretation. The type specimen literally acts as the **name carrier**. All the type specimens associated with the genus must be studied in order to determine the correct name for each species. The type of a species or subspecies is a single

3 'infra-' is classical Greek meaning 'below', infrageneric= 'below the genus level', i.e. a species.

herbarium specimen. The type of a genus is a single species within that genus (i.e. *Ranunculus acris* is the type for *Ranunculus* – if the genus *Ranunculus* is ever split into two or more genera then the part containing *R. acris* keeps the generic name *Ranunculus*, and the other part or parts must have different names). The type of a family is a single genus within that family (Ranunculaceae is typified by *Ranunculus* – in the same way, if Ranunculaceae is split into 2 or more families, the family containing *Ranunculus* always retains the name Ranunculaceae). These types act as name carriers, and relate the nomenclature (a human mental construction) to biological taxa (the real world).

In cases where formerly separate species are **combined**, it is the oldest name that was correctly published that becomes the correct name for the taxon, and all later names become **synonyms**. An example is the lowland oak species, *Quercus robur*, which has been given 120 scientific names over the past 250 years.

INTERNATIONAL CODE OF BOTANICAL NOMENCLATURE

When a plant taxonomist describes or compares previously described species they follow particular rules that are laid down in the International Code of Botanical Nomenclature (ICBN). With new taxa, these rules require that it is given a Latin (species) name that has never been used before, that it is described in Latin, and that a type specimen, at a particular institution, is nominated. Where species have been given more than one name in the past, decisions about which is the correct name, and which are synonyms, are governed by other rules, in this case by the rule of priority. There are six major principles that summarise the ICBN rules, they are :

1. That it is independent of zoological nomenclature. (e.g. *Pieris* is the genus of the cabbage white butterfly as well as that of the ericaceous shrub, but because they are covered by different codes they are both legitimate)
2. Use of type specimens.
3. Priority. *Species Plantarum*, 1 May 1753.
4. Each taxon can have only one correct name, the earliest that is in accordance with the rules. This name has to be:
   Effectively published (a publicly available journal or in book form)
   Validly published (name; Latin description; and a type.)
   Legitimately published (e.g. not a homonym or type of another sp.)
5. Latin. Use of proper Latin grammar is required.
6. The Rules of nomenclature are retroactive (they apply backwards in time unless a particular date is fixed, e.g. Latin was not required until 1959).

Once completed, the revision is submitted for publication in a scientific journal. Before it is published other taxonomists will critically examine the paper. This peer review process ensures that only carefully researched and competently undertaken revisions are published.

As new discoveries and new techniques are constantly providing new evidence, so the taxonomist's view must constantly be updated. Some of the reasons that plants change their names are as follows:

WHY TAXONOMISTS CHANGE PLANT NAMES

There are three main reasons why a plant name may change:

1. **TAXONOMIC**. A species might be transferred into a different genus, or combined with one or more other previously segregated species, or divided into two or more 'new' species.

   SYNONYMS**:**

   - ***Salix hibernica*** was described by Rechinger in 1963 from a tiny population on a mountain in the west of Ireland. However, the plant scarcely differs from a species of Willow found throughout northern Europe from Denmark to arctic Russia – *S. phylicifolia* L. described in 1753. *Salix hibernica* is therefore now treated as a synonym of the former species.
   - ***Quercus robur*** – the pedunculate Oak – has been christened over 120 times: i.e. as *Q. pedunculata* by Ehrhart in 1790, but Linnaeus' name dates from 1753. Again, the rule of priority applies – the oldest published name is the correct name, and all later names are synonyms.
   - ***Francoa sonchifolia*** used to be classified as a number of species, such as *F. appendiculata*, *F. glabrata* and *F. ramosa*. In reality there is only the one highly variable species, and *F. ramosa*, for example, was distinguished because of its white flowers.

   BETTER UNDERSTANDING OF BIOLOGICAL RELATIONSHIPS:

   - The Bluebell was first described as ***Hyacinthus non-scriptus*** by Linnaeus in 1753. Because later authors realised that the genus *Hyacinthus* contained rather different plants, the original genus was

split into several parts, and the Bluebell was then placed in the genus *Endymion* in 1849. Many species assigned to this genus, however, later proved to be a part of the genus *Scilla*, and therefore it again was divided up in 1934, with the Bluebell being placed in a third genus –*Hyacinthoides non-scripta* (L.) Chouard ex Rothm. Which is the name it carries today.

- ***Luma apiculata*** has cinnamon-red coloured bark and flowers in autumn. It used to be classified in the genus *Myrtus* as *M. luma* Mol. ***Amomyrtus luma*** has rough brown-coloured bark and flowers in spring. It was also once placed in the genus *Myrtus* as *M. lechleriana*, and was even given the name *Myrtus luma* as well! (but by a different author and at a later date than the foregoing species). A better understanding of the relationships of Myrtaceae meant that these South American species couldn't be left in the same genus as *Myrtus communis*, which is one of just two species in a strictly Mediterranean genus.

2. MISIDENTIFICATION. When a plant is first brought into cultivation it might be widely propagated and distributed under a wrong name.

- ***Sutera cordata*** was first brought into the UK from South Africa in mid 1992, and marketed under two names: either as *Bacopa* 'Snowflake' or *Sutera diffusa*. The former genus name is taxonomically quite distinct, whilst *S. diffusa* is a made up name, one that has never been published.

- *Hypericum fragile* and *H. repens* are names often used in older encyclopaedias and plant catalogues when referring to ***Hypericum olympicum***. The true *H. fragile* also comes from Greece but is a smaller shrub with rounded leaves, whilst *H. repens* is a small creeping plant from Cyprus. Because these names already apply to quite different species their misapplication is usually referred to under the synonymy of *H. olympicum* as: *Hypericum fragile* **hort**. and *H. repens* **hort**. i.e. these were horticultural applications of the name and not an authors name such as L. for Linnaeus.

3. NOMENCLATURAL. Names may have been incorrectly described, or older names, which have priority, may have been overlooked until recently.

- Garden chrysanthemums were once correctly named ***Chrysanthemum indicum***. In 1855, however, the species was transferred to the genus ***Dendranthema***, a name which was overlooked by gardeners and nurserymen, as well as by many taxonomists, for almost 100 years. In the last 20 years *Dendranthema* began to appear in catalogues and nursery lists, but most horticultural circles continued to ignore the 'correct' name. The reason this came about was that the original genus *Chrysanthemum* had been split into two unrelated parts. When this occurs, the original name cannot be arbitrarily assigned to one part of the genus and the other part given the new name. Instead one species within a genus carries the genus name (in the same way that one specimen carries the species name – see the section on Type Specimens). The genus name *Chrysanthemum* could no longer be used for garden chrysanthemums because the genus was typified on a different species. However, to allow for the instability and sometimes unsettling logic of the code, an allowance is made to **conserve** names of a species, a genus or family if the legally (under ICBN rules) correct name might, or does, create nomenclatural instability. i.e. dictionaries and encyclopaedias published over many years would suddenly become 'out-of-date' because of a change in name, especially if the plant is of widespread horticultural or economic importance. In 1995 it was therefore proposed that ***Chrysanthemum indicum*** should be conserved over *Dendranthema indica*.

- ***Erica vagans*** L. was first published in 1753 as a description for an Eastern European species. Unfortunately in 1791 it was incorrectly used for a species found in N. Spain, W. France, S.E. England and N.W. Ireland. If the ICBN rules were strictly followed this name, in use for 200 years, would have to have been changed to ***E. didyma***. In this case, not only was the name conserved, but a new Type specimen also had to be conserved (because Linnaeus' type was carrying the original application of the name). A second common garden heather – ***Erica carnea*** – has also had its name conserved (over E. herbacea).

- The Giant sequoia or Wellingtonia (***Sequoiadendron gigantea***) was originally named *Wellingtonia gigantea* in 1853. However, the generic name had already been used in 1840 to describe a small Asian tree now synonymous with ***Meliosma*** (Sabiaceae). The second usage is called a **homonym** (same name), and cannot be used.

- ***Erica erigena*** was first described as *Erica hibernica* in 1866, unfortunately the same name had already been used for a winter-flowering heather in South Africa in 1839 (hibernica = winter or

Ireland). *E.erigena* is a new name (coined in 1969), but the original description and type are still valid.

CULTIVARS

The word cultivar comes from **cultivated variety**. The two essential feature of a cultivar are:

1. **Distinct** characteristics that make it differ from previously described cultivars of the same species, and that it can be
2. **Reproduced reliably** and maintained in cultivation. They cannot be freak mutations or trees of a peculiar shape.

Cultivars can originate from a number of sources:

- **WILD SELECTIONS**: many cultivars have simply been found in the wild: *Daboecia* 'Charles Nelson', *Erica mackaiana* 'Flore Pleno', and *Erica mackaiana* 'Maura' are all wild-collected heathers with double-flowers.
- **CLONES** can only be reproduced by division, cuttings, grafting etc.
- **INBRED LINES** by inbreeding annual plants it is possible to maintain particular characteristics that are retained even with open pollination.
- **F1 HYBRIDS**: hybrids often don't breed true, and must be 'manufactured' each year. Many vegetables are formed like this; Maize is a particularly important F1/F2 crop.

Cultivars used to be described in Latin, but since 1959 they have to have names in a modern language, and may be described in any language.

Cultivars used to be written thus: ***Potentilla fruticosa* cv. Tangerine**, but now they should be written: ***Potentilla fruticosa* 'Tangerine'**. One of the reasons for this change in style was to distinguish cultivars further from the Botanical code and make it more accessible to the plant propagator rather than the preserve of the professional scientist.

HYBRIDS are always denoted by a multiplication sign either between the parents [N.B. **x**_ or **x**] On most computer keyboards the multiplication sign can be inserted by holding the **Alt** key down and typing 0215 on the numeric keypad: ×. Alternatively, using a font like Arial will produce An x without Serifs: x. In addition beware of computer sorting of hybrid names, an x will come near the end of a list, an × will come before all the names. Databases and spreadsheets can avoid this problem by having a separate field for hybrid names.

Camellia japonica* × *Camellia saluenensis

or the hybrid may be named: ***Camellia* ×*williamsii***,

or ***Camellia* x *williamsii*** [N.B. space]

For intergeneric hybrids the x comes before the name:

Cupressus macrocarpa × Chamaecyparis nootkatensis

=> ×*Cupressocyparis leylandii*

A hybrid cross used to be named under the old ICBN code and given a Latin name, such as ***Eucryphia* ×*nymansensis*** which was made at Nymans' Gardens. Nowadays Latin hybrid names are only published, if at all, for wild-collected hybrids. Whilst the possibility of creating hybrids between plants collected in widely disparate locations being grown together makes the use of cultivars more acceptable.

Primula ×kewensis was an artificial hybrid first raised at Kew Gardens in 1899. It originated as a cross between *P. floribunda*, from the N.W. Himalayas and *P. verticillata* from Yemen, Saudi Arabia. This was a sterile plant which had nine chromosomes from one parent and nine from the other. However this sterile hybrid has on three separate occasions spontaneously formed fertile individuals. These have been found to have 36 chromosomes – by doubling the chromosomes each of the original 18 now has an exact copy, and the plant can therefore reproduce sexually. Thus this plant is no longer a sterile cultivar but forms a true-breeding population isolated from both the parents – it is in fact behaving like a species and can be written ***Primula kewensis***.

Aesculus ×carnea, and ***Meconopsis ×sheldonii***, are also hybrids that have double the expected number of chromosomes and are fully fertile amongst themselves. They can also be described as new species of garden origin.

GREX is still occasionally used in orchid and rhododendron classification - it is the Greek word for a herd (hence the derivation *greg*arious). These are products from a hybrid cross.

Most saxifrage cultivars have been made through hybridisation followed by selection of the resulting progeny. Thus the products of the cross *S. aretioides* × *S. burseriana* were at one time referred to as *S.* ×*boydii* but since such a hybrid cannot occur in nature (the former is Pyrennean the latter Alpine) and because each individual differs, the hybrid formula or name is somewhat arbitrary, and instead selected forms are individually named as cultivars thus: ***Saxifraga* 'Aretiastrum'**, ***Saxifraga* 'Cherrytrees'**, ***S.* 'Corona' *S.* 'Faldonside'**. Rhododendrons have been

bred in a similar manner, and a hybrid name alone gives little information about the appearance of a particular clone.

GRAFT-CHIMAERAS (GRAFT-HYBRIDS) are denoted with a plus sign before the name, and are often given a 'new' generic name. A Chimaera was a mythical beast in classical times; with the head of a lion, the wings of an eagle, and the body of a goat. In botanical terms a chimaera consists of different layers of cells.

Adam's Laburnum, ***+Laburnocytisus adamii***, arose in the nursery of Jean Louis Adam in France in 1825. Monsieur Adam had grafted the buds of the purple-flowered ***Cytisus purpureus*** onto a trunk of ***Laburnum anagyroides***. Shoots that arose from the grafting site had a unique mixture – the outer cell layers were of pure *Cytisus*, while the inner cell layers were of pure *Laburnum*. The resulting plant has an amazing mixture of stems, representing 3 distinct forms of inflorescence: some which have reverted to one of the parents, whilst the third form has uniquely brownish-coloured and intermediate shaped and sized inflorescences.

+***Crataegomespilus dardarii*** arose as a graft chimaera when *Mespilus germanica* (Medlar) was grafted onto *Crataegus monogyna* (Hawthorn). This should not be confused with ×***Crataemespilus*** **grandiflora**, a hybrid between the same two species.

HOW TO PUBLISH A NEW CULTIVAR.

Publishing a new cultivar is considerably easier than publishing a new taxon of plant. To be legitimate a new cultivar name must be published in a journal or nursery catalogue, along with a description, and means of distinguishing it from other cultivars. The naming of cultivars is based on priority of publication, as in the Botanical Code. For many plant groups there is also a **International Cultivar Registration Authority** (ICRA). For many horticulturally important plant groups the ICRAs regulate new cultivars by requiring submission and registration, and they publish regular lists of new cultivar names. For example, there are over 23,000 registered cultivars of Daffodil. The importance of such a list in preventing the use of duplicate names is obvious.

CULTIVATED PLANT CODE

The International Code of Nomenclature for Cultivated Plants (ICNCP) (1980, 1995). The code is simpler, shorter and independent of the Botanical (ICBN) code. The rules can be summarised as:

1. Cultivar names must be written in roman case, with single inverted commas. NOT cv. or var. or f. (these latter 2 are covered by the Botanical code).
2. Up to three words, but 1 or 2 preferred. Initial letter of each word capitalised, except prepositions (de, of, etc.). Hyphens and numbers are permissible (Numbers are commonly used for agricultural cultivars, i.e. barley, wheat, sugar beet etc.)
3. Specific epithet may be dropped in genera with complex or unknown ancestry, *Rosa* 'Daisy Hill', *Narcissus* 'Empress of Ireland', *Ilex* 'Mary Nell'.
4. A cultivar name given after 1 January 1959 must not be in Latin, unless it was published under the ICBN rules. The name cannot include the following words: variety, form, hybrid, grex, group, seedling, sport, strain, selection, mutant, improved, transformed etc. (*Geum* 'Mrs. Bradshaw Improved' is an unacceptable and invalid name). Vernacular names, e.g. *Erica* 'White Heather' are NOT permitted. Especially NOT Latin generic names e.g. *Rosa* 'Corylus'.
   However there are still problems and uncertainties: *Camellia* 'Rose' or *Crocosmia* 'Lavender' - are these colours, or are they plant names ?
5. Cannot be common descriptive words or phrases: 'Large', 'Large White', 'Double Red', are NOT permitted.
6. should not (n.b. not must not) be translated into different languages. If they are, then they are all synonyms. With Japanese cultivar names transliteration is often a sensible compromise.

Cultivar groups. e.g. *Fagus sylvatica* Atropurpurea Group, (no longer *F. sylvatica* 'Atropurpurea'). This provides a category below the genus level. *Clematis* (Patens Group) 'Nelly Moser' . However, there are still major differences of opinion about the use of **Groups**, and at present there are 3 major usages:

1. An assemblage of named cultivars (the correct usage under the ICNCP code).
2. Unnamed cultivars that are 'nearly' the cultivar, but not quite.
3. Variable cultivars, whose characters are a bit fuzzy.

TRADE DESIGNATIONS AND PLANT BREEDER'S RIGHTS.

As well as describing a new cultivar in a valid manner, it is also possible to register a 'name' (NOT the cultivar name, which is the 'generic' [under Trademark Law] name for the cultivar, but not the protected 'name') with the National Authority for Plant Variety Rights, this gives the plant breeder a

patent (**Plant Breeders' Rights** or **PBRs**), which restricts others from propagating and selling it without paying royalties for 17 years. You cannot patent a plant after it has been offered for sale for more than 1 year. Obtaining a PBR, and obtaining (and retaining) a registered Trademark both cost substantial sums of money. It is only in 'big money' crop plants that such patents are worth pursuing (Wheat, Sugar beet). Whilst PBRs restrict others from stealing 'your' cultivar, farmers are exempt, and can resow their seed, and anyone can use the plant for their own breeding programs.

Genes however can be patented virtually for ever, hence marketing a GMO (Genetically modified Organism) means nobody can use your variety, if it contains your copyrighted gene, in their breeding programs without paying a royalty. Nor can farmers save and resow their seeds without paying a royalty to the plant breeder.

Rosa 'Fryzebedee' is marketed as **The Cheshire Regiment**. This latter name is called the **Trade Designation** (or selling name) and is never written in inverted commas and usually written in a different typeface. However it is a legal requirement for the correct cultivar name to appear on a label (Trade's Description Act). Thus it has to appear as:

The Cheshire Regiment = **Rosa** 'Fryzebedee'

***Rosa* 'Goldjuwel'** has the Trade designation **Golden Jewel™** – this is an Unregistered Trademark name, which basically means it is not legally protected except under Common Law. If somebody other than the breeder of Golden Jewel starts selling it, they can be prosecuted in a private action, with the plaintiff having to prove financial damage from the activities of the second seller.

***Rosa* 'Dicjana'** is marketed as **Elina ® –** this name is a Registered Trade Mark. This means that the trademark has been registered with the Trade Mark authority, and is legally protected. A registered trademark may be renewed indefinitely. When the patent (PBR) expires, anyone may propagate and market the plant ('Dicjana'), but they cannot call it **Elina**, this is still the property of the original producer – so long as the trademark has been protected by the originator.

If either of these names appears as a *Rosa* cultivar (i.e. *Rosa* 'Golden Jewel' or *Rosa* 'Elina') then the rights may be lost, because the mark is being used as a 'generic' term, simply through careless maintenance by the owner. For example, Aspirin lost its trademark status because Bayer Co. allowed it to become a household name.

By giving the valid cultivar names gobbeldy-gook, or unpronounceable names (Fryhapsody, Fryworthy, Fryyippee, Fryyorston are all roses bred by Fryer's nursery, in Cheshire; Tanotax, Taninaso etc.) the original producer ensures that the **Trade Designation** (Trademark Name or Selling Name) is more likely to be associated with the plant for much longer than the 17 years. In the same way **Hoover** has become inseparably associated with vacuum cleaners, and **Weetabix** is instantly associated with 'Whole wheat breakfast biscuits'! In catalogues, these trademarks may be designated ® or **TM**.

Potentially there is no end to the number of Trade Designations a plant variety may have.

Intellectual property is the product of mental labour.

A **copyright** protects a literary or artistic expression from being copied.

A **trademark** is legally defined as a word(s) or symbol which identifies the place of origin of a product. A registered Trademark protects that name or symbol from being used for a different product.

A **patent** is an official document from the Patent Office which allows an inventor to exclude others, for a limited time period, from developing, selling, or using a device, process, or design (a tangible thing). With plant varieites, food products and other 'perishable items' the time limit is something around 15-17 years.

A **Plant Breeders Rights** is a patent on a plant

WRITING AND READING PLANT NAMES CORRECTLY.

UNCERTAIN NAMES

You may come across names written with certain elements of doubt:

?*Quercus robur*..... means .....'perhaps this is *Quercus robur*'
Pinus ?*sabiniana* ..... means ....'This is a *Pinus* sp., possibly *P. sabiniana*'
Tilia aff. *tomentosa*..... means ..... 'This is close to *T .tomentosa* [*affinis* ="related to"] but doesn't match the description exactly : it might be an extreme variant or a hybrid.'
Tilia cf. *tomentosa*.....means 'This plant is very similar to *T. tomentosa* [*confer* = "compare"], but is <u>not</u> that species.'
Rubus fruticosus sens. lat. means ..... 'Blackberry or Bramble (*R. fruticosus*) in the broad sense [*sensu lato*]', because *R. fruticosus* exists as ca. 80 microspecies in Ireland.

- The first letter of the genus name is always upper case and the first letter of the specific epithet (and subsp. epithet, varietal epithet etc.) is always lower case.
- Latin genus and species names should always be italicized when they appear in text that is in roman type; conversely, these Latin names should be in roman type when they appear in italicized text. The rank designation should <u>not</u> be italicized.
- Names of suprageneric taxa (above the genus level, e.g. families), are never italicized when they appear in roman text. The first letter of these names is always upper case.
- When the genus name is used as a vernacular name (not Latin) within text or captions, it is not italicized. When in the singular the first letter of the genus name can be <u>either</u> upper or lower case. When in the plural, the first letter of the genus name should <u>always</u> be in lower case, e.g. "many magnolias bloom in January". When it is the first word in a sentence, the first letter of the genus name should always be upper case, whether singular or plural.

Cultivar names

- The cultivar name is designated by single quotation marks. It should never be designated by double quotation marks or the abbreviation "cv."
- The cultivar name is never italicized when it appears in roman text.
- The first letter of each word is upper case, except for conjunctions and prepositions (of, de, no).
- In hyphenated names, the first letter of words after hyphens are lower case ('Aureo-variegata')
- Once the entire name has been mentioned in text, the genus name may be abbreviated.
- A cultivar name may be listed alone, without its scientific name, as long as it is clear in the text to which name that cultivar belongs.
- Many cultivars are of hybrid origin. These names are never separated by an "x" or multiplication sign; e.g. *Canna* 'Endeavor', not *Canna* × 'Endeavor'.

Common (vernacular) names

- Common names should never be italicised when in roman text.
- There are no rules governing the usage of common names, as there are for scientific names. The most important point is that common name usage should be consistent throughout an article, a periodical, or a book. Normally common names do not have their initial letter capitalised except when the word is a geographical or personal name.
- A common name can be combined with a cultivar name: potato 'Cara', rose 'Dublin Bay'.
- It is useful to include a hyphen when part of the plant name does not correctly reflect the botanical classification of the plant, e.g. rock-rose is not a rose, sea-holly is not a holly, etc.
- A genus name is often used as a vernacular name for a single species (Calathea), more than one species (calatheas), or the entire genus or its family (marantas).
- Non-Latin common names of groups of plants (e.g. orchids, palms) always have their first letter in lower case, whether singular or plural, except where they occur as the first word in a sentence.
- Trademarks are proprietary names that should be used in accordance with trademark laws and must always contain either the ™ or ® symbols (the latter for registered trademarks only). There are not fixed to a single cultivar, and can easily be used, by the originator for almost any cultivar they choose. Trademark names should <u>never</u> appear in association with the generic name, nor in single quotation marks nor should they be italicised when in text in roman type. For example Rosa Saint Cecilia, or Rosa 'Saint Cecilia' are both wrong; the correct name (the official cultivar name) for the plant is Rosa 'Ausmit', and the plant can be referred to as "the rose Saint Cecilia", or Rosa 'Ausmit' SAINT CECILIA®. The name Saint Cecilia has been registered by David Austin Roses Ltd. for use with any Rose they wish to sell under the

name. If they choose they are at liberty to apply it to a different rose cultivar in the future. Trademarks serve only as brand names to identify the source or origin of the plant, not the plant itself. There is no nomenclatural requirement to include a trademark name as part of the plant name, and to lessen confusion it is preferable to list plants with only their scientific and cultivar names. However, if there is some compelling reason to include it, the proper way to list a plant name containing a trademark would be Rosa 'Ausmit' SAINT CECILIA®, or Rosa TRUMPETER® 'Mactru'.

- Trade designations are names that may be used when a cultivar name is deemed unsuitable for marketing purposes, such as those in a foreign language. These names function more to identify the product rather than the source or origin, and should not be confused with trademarks. Trade designations should be listed with the plant name in a similar manner, set off typographically in upper case letters, e.g. *Potentilla* MOONLIGHT 'Maanelys'.

Questions & Answers

What is the difference between a species and a cultivar ?

The former is found 'in the wild' the latter has been brought into cultivation and maintained by people.

What is the difference between a specific epithet and a species name ?

A species name such as *Quercus petraea* is made up from the genus name (Quercus) and a specific epithet (petraea = Lat. For 'stone', because it grows in rocky mountain soils). Petraea on its own is not the species name, but the specific epithet.

What is a subspecies ?

A geographical variation found within the range of a species, but which is not different 'enough' to make into a species of its own.

What is a variety ?

An ecological variant found within the range of a species, maybe a mountain form or a

What is a forma ?

A morphological variant found within the range of a species, maybe with coloured leaves, different coloured flowers (typically white-flowered forms).

What is a Genus ?

A human idea for grouping similar species together usually on one or a few morphological characters. Genera (plural) don't exist in nature, only species do.

What is a plant Family ?

A broader category than a genus, but still a human idea, to cover all species which probably have a common origin and can be recognised on certain characters in common.

Why are scientific names in Latin ?

Latin was the language of scholarship until 200 years ago – all scientists could read and understand the language. Because Latin is a dead language (no country actually speaks the language) it never changes, and a 17th Century dictionary for example is still up-to-date. Thus Chinese, Russian and English-speaking taxonomists can all communicate and understand one another's species descriptions. It is a very precise language, with thousands of descriptive terms.

What is the authority of a plant name, and why are they needed ?

When a new species is first described, and named, the person describing the species is referred to as the author. Sometimes the same name has been used for different species or genera, in these cases it is important to

know which author ‘s name is being referred to. i.e. *Erica hibernica* **(Hook. & Arn.) Syme** in 1866 and *Erica hibernica* **Utinet** in 1839.

Why do plants sometimes change their names ?

The plants don’t actually change their name, but taxonomists sometimes have to change a plant’s name for one of three main reasons:

- TAXONOMIC: Because it is discovered that the plant is not correctly classified and in fact comprise more than one species, or is part of a much more widespraed species and is just a form of that species, or it may belong to a different genus.
- MIS-IDENTIFICATION: Because they were originally mis-identified.
- NOMECLATURAL: Because the plant was described early than it was thought, or the name is already being used for a different species of plant.

What is a synonym ?

A synonym is a different, but incorrect, name for the same species of plant. Many plants have been accidentally re-named, for example *Quercus robur* has been named more than 100 times. The very first name ever applied is the correct name, and all later names are synonyms.

What is a type specimen ?

When a new species is described, a single dried herbarium specimen is selected by the author of the name as a ‘typical’ example of the species, and is referred to as the Type Specimen. If the author omits to describe some character, or there is some doubt about the validity of the species, then this specimen can be consulted.

What is the difference between "cv.”, and using inverted commas ?

Using inverted commas is now mandatory under the Cultivated code, so as to prevent any confusion with wild taxa.

What plants need to be registered, and how do you register a new cultivar ?

Most garden plant genera have an International Cultivar Registration Authority. These are best located on the internet.

What is the difference between a selling name and a cultivar name ?

A cultivar name is the generic name (not in the botanical sense of the word!) of the product (*Rosa* ‘Goldjuwel’), the selling name is a name a nursery or shop uses, a trademark (Golden Jewel). If the selling name is written in the form of a cultivar by the seller (*Rosa* ‘Golden Jewel’), then the trademark status is lost, because the name has been used as a ‘generic’ name.

What are “Plant Breeder’s Rights” ?

A patent on a new cultivar of plant. The rights prevent others from profiting from the cultivar for ca. 17 years.