
Introduction

Purpose of Nomenclature

For most societies plants are major sources of food, medicine and other essential products and so over time each species has acquired a name which may differ from place to place making it difficult for potential users to share their knowledge. Hence it is not surprising that one of the earliest botanical records is a list of medicinal plants from the Euphrates Valley along with their equivalent names in the Nile Valley. The need for such lists arises whenever the same species is known by different names in the same or different places.

Likewise, it is important to be aware that when the same name is applied to different species failure to distinguish between the two may have disastrous consequences. For example, in Australia, *Solanum nigrum* is widely known as Deadly Nightshade, notwithstanding that its ripe berries are not poisonous (Everist 1979) and often eaten. In contrast eating the similar looking berries of the English species known as Deadly Nightshade (*Atropa belladonna*) could be fatal.

To avoid the confusion that can result from a species having more than one name, or different species having the same name, an international system of nomenclature has been devised. Because the originators of the system were Europeans, for whom the language of scholarship was Latin, the Swedish author of the pioneer text on the subject (Linnaeus 1753) wrote in that language. The Latin he employed, specially for describing plants, differed considerably from that of Classical Times and like Ecclesiastical Latin is always evolving with an expanding vocabulary to account for new structures and ideas. This subject is admirably dealt with by Stearn (1992) who in his "Botanical Latin" discussed many of the problems associated with the formation of binomial names and provided a synopsis of the views propounded by Linnaeus (1753) on the subject.

In "Species Plantarum" Linnaeus assigned every species to a genus and each was briefly described. In the margin beside each description was a single italicized word which usually referred to some salient feature of the species. This word together with the generic name became known as a binomial. Today the binomial is the basis of the nomenclature by which all species are known internationally.

The application of these names is controlled by an "International Code of Botanical Nomenclature" (Greuter 2000) which is subject to periodic revision. The objective of the Code, which encompasses all taxonomic ranks up to and including Family, is to stabilize nomenclature so that each plant has only one name, thereby making it easier to search the literature for information concerning taxa and especially species.

Since the generic and specific names derive from many sources their meanings are often difficult to determine, unless the reader has access to a large botanical library.

Language of Nomenclature

Though not the first botanist to employ the concept of binomial names to plants, Linnaeus produced the first world flora wherein he gave generic and specific names to all the flowering plants of which he was aware. In the binomial, the generic name precedes the specific and is always written with an initial capital letter. The initial letter of the specific name is nowadays written with a lower case initial but in former times it was customary to capitalize the initial letter if the species was named after a proper noun such as a person or a genus.

Binomials must be written using the letters of the Latin alphabet and are treated as a shorthand version of a sentence in that language. Accordingly, the grammatical rules of Latin are followed, treating the genus as a noun and the species as either an adjective or a noun. If the specific name is an adjective it will agree in gender with that of the genus.

Because the Code was formalized relatively late in the history of taxonomic botany, strict application of its recommendations may result in minor changes to the spelling of older names. For example, prior to the acceptance of early versions of the Code it was not uncommon for botanists to emend spellings on quite arbitrary grounds, which usually reflected how the writer chose to transliterate the spelling, into the Latin alphabet, of words from other languages.

For example, Jacquemont in 1809 coined the generic name *Dinebra* basing it on the Arabic vernacular name of the type species; a few years later in 1830 Presl emended the spelling to *Dineba* claiming his transliteration of the Arabic to be better than that of Jacquemont. Whether or not he was correct, the Rule of Priority established by the Code demands that the original spelling of the name must be accepted, unless a compelling case can be made to the contrary.

With transliteration from Greek to Latin the problem is complicated by a lack of consistency amongst scholars from different countries. When Loureiro proposed the generic name *Rhaphis* (1790) he transliterated the Greek *rho* (ρ) as 'rh' whereas twenty-two years later Palisot de Beauvois (1802) transliterated the same letter as 'r' when he coined the name *Rabdochloa*.

In Classical Greek times it was the custom when compounding two words to double *rho* when it was the initial letter of the second word. A common method of writing such compound words, in Botanical Latin, was to treat the first *rho* as the letter 'r' and the second as 'rh', a practice accepted in modern English for words such as diarrhoea (alternative spelling diarrhea) which derives from the Greek *diarrhoia* through the Latin *diarrhoea*.

Grass genera that follow this rule are *Tetrarrhena*, *Triarrhena* and *Diarrhena*. The eccentric biologist Rafinesque later spelt *Diarrhena* as *Diarina* – although the earlier name has priority under the Code, the alternate transliteration of the Greek would be acceptable under other circumstances.

The convention adopted for the transliteration of *rho* has varied over time and the original spellings of names have sometimes been revised to suit the fashion of the day. Thus *Haloragis*, a dicotyledon, was spelled so by the authors of the genus in 1775 but during the 19th century the name was often changed to *Halorrhagis*, a practice now abandoned in favor of the original spelling.

Although generic names always assume a Latin form, their spelling, especially if transliteration is involved, is not independent of the nationality of the describing au-

thor. For example, *Moorochloa* was described by a Dutch national who based the name upon the Greek word *moros* (μωροσ) transliterating the omega (ω) as 'oo' and the omicron (ο) as 'o'. Such a practice would not be followed by an English author who would translate as 'o' both omicron and omega, as in the word 'moran', which is derived directly from the Greek.

Because some phonemes of the Scandinavian languages are not represented by letters present in the Latin alphabet, their transliteration has sometimes led to variant spellings of the same name. Thus, the distinguished Swedish botanist Pehr Forsskål (1732–1763) has been honored by the following species epithets: *Avena forskålei* Vahl, *Aristida forskohlei* Tausch, *Chaetaria forskholii* Nees and *Danthonia forskalii* Trinius. In modern binomials, only the dieresis, denoting separate pronunciation of adjacent vowels (as seen on the 'e' in *Chloë*) is acceptable. All other diacritic marks and non-Roman letters are to be substituted by Roman letters; thus, the umlauts ä, ö and ü are represented by 'ae', 'oe' and 'ue' respectively, while the Scandinavian å becomes 'ao'.

With Russian and other languages that use the Cyrillic alphabet, problems of transliteration can become acute and even in Russian texts the same grass may be known under quite different spellings of the same name. Thus *Agropyrum tschimganicum* was described in 1923 by Drobow who two years later referred to it as *A. czimganicum*.

When a language has no alphabet, as with Japanese, names prior to their latinization must be transliterated into one that does. Thus *Tschonoskia* is based on a German version of Chonosuke, the forename of a Japanese botanist.

Structure of Grass Spikelets

Many specific grass names are based on the spikelet structure, which in the past has been the subject of much debate. For example, it has been interpreted both as a flower and part of the inflorescence. As a consequence, specific epithets based on descriptive terms do not necessarily have equivalent meanings. Presently there is little disagreement as to the structure of the spikelet (Clifford 1987).

In its most generalized form the spikelet consists of several alternating bracts, all but the lower two of which bear short shoots, each of which has a prophyll (palea) beyond which are 2 or 3 scales (lodicules) and then the anthers and pistil. The bracts, also known as glumes, are then divided into sterile or fertile depending upon whether or not they support short shoots. Furthermore, the sterile glumes are referred to as subtending glumes, if they are at the base of the spikelet and the fertile glumes as lemmas. A lemma together with its attendant palea, lodicules and reproductive structures is known as a floret. The flower is generally taken to be the reproductive structures along with the lodicules.

In earlier times the spikelet was sometimes regarded as a flower, as attested to by the name *Monanthochloë* whose inflorescences consist of a single spikelet. However each of the spikelets has several florets and accordingly several flowers and so the name is misleading unless interpreted in an historical context.

As their role changed from words in every day use to technical terms many Latin and Greek words also changed their meanings and over time many of these have become quite different from the originals. A few of the changes especially relevant to grass morphology are given in Table 1.1.

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Clifford, H.T.; Bostock, P.D.

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