BOTANICAL NOMENCLATURE

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What is Botanical nomenclature

- Botanical nomenclature is the scientific system for naming plants. That means the name assigned to a particular plant species is based on rules of Botanical nomenclature system, mainly the International Code of Nomenclature for algae, fungi, and plants (ICN).

Principles of ICN

- The names of taxonomic groups are determined by nomenclatural type.
- If a species is new then author must mention the type of specimen on which new species is based.
- The nomenclature of taxonomic group is also based on priority of publication.

Rules of nomenclature

- **Nomenclatural types**

  A nomenclatural type is that element of a taxon to which the name of a taxon is permanently attached. The nomenclatural type of a species is an individual herbarium specimen mounted on a sheet. Careful presentation is essential as they are the records of the present and past. If a specimen cannot be preserved in dried form it should be recorded by diagnostic drawing, photographs and proper description.

Following terms are commonly used in the nomenclature of types:

(a) Holotype:

Specimen or other element designated by the author or used by him as the nomenclatural type.

(b) Isotype:

It is duplicate copy of the holotype. During collection several plants or plant branches are collected. Later one is selected as holotype and rest are
considered as isotypes.

(c) Syntype:

When more than one specimen are cited by the author without mentioning which is the holotype, each specimen is designated as a Syntype.

(d) Paratype:

Specimens cited along with the holotype are designated as Paratypes.

(e) Lectotype:

This is a substitute of the holotype when that is lost and is to be selected from the isotypes. When no holotype was designated by the author a specimen from the original material is selected to be the Lectotype.

(f) Neotype:

A neotype is a specimen later selected to serve as the single type specimen when an original holotype has been lost or destroyed or where the original author never cited a specimen.

(g) Topotype:

Specimen of a species collected at the same locality as the holotype.

(h) Epitype:

A specimen or illustration selected to serve as an interpretative type, usually when another kind of type does not show the critical features needed for identification

- **Principles of Priority of Publication:**

When it is necessary to choose between two or more names or epithets which have been applied within a given taxonomic group, the principle of priority of publication is applied, the earliest name or epithet which will be in accordance with the rules being chosen.

It is valid from 1st May 1753 for most of the plants excepting fungi, some algae and the Muscineae other than the Sphagnaceae.

Limitations of the principle of priority

- A name of a taxonomic group has no status under this Code and has no claim to recognition by botanists, unless it is validly published.

- Legitimate botanical nomenclature for all groups of plants begins with the publication of Linnaeus, Species Plantarum, ed. 1 (1753), with the following exceptions:

a. Muscineae, 1801 (Species *Muscorum*).
b. Fungi: Uridinales, Ustilaginales and Gasteromycetes, 1801
c. The following algae: *Nostocaceae homocysteae*,1891-93; *Nostocaceae heterocysteae*,1886; Desmidiaceae,1848; Oedogoniaceae,1900.

It is agreed to associate generic names which appear in Linnaeus Species Plantarum ed.1 (1753) and ed.2.(1762-63), with the first subsequent descriptions given under those names in Linnaeus Genera Plantarum, ed.5 (1754) and ed.6 (1764).

- As the strict application of rules some times leads to undesirable changes in nomenclature, certain widely used names are conserved as exceptions. These names are principally such as have come into general use in the fifty years following their publication, or have been used in monographs and important floristic works or are widely known to horticulturists, foresters, and the general public. They include names of families, genera and species.

- The application of conserved names is determined by nomenclatural types or by substitute-types where necessary or desirable.

- Names of Taxa

➢ The name of a species is a binary combination consisting of the name of the genus followed by a single specific epithet. The name of a genus is a substantive in the singular number. The specific epithet is an adjective and is of the same gender as the generic name, or is a noun in opposition to the generic name. The specific epithet must not exactly repeat the generic name.

➢ The name of an infra-specific taxon is a combination of the name of a species and an infra-specific epithet connected by a term denoting its rank. The name of a genus or of a taxa of higher rank is spelt with a capital initial letter. All specific and infra-specific epithets should be written with a small initial letter.

- The name of a family is derived from the name of the genus which is the type for the family.

- Endings of the names of taxa above the rank of genus should be in the manner noted below:

Kingdom- Plantae (no fixed suffix)
Division- phyta (Spermatophyta)
Class- ae (Dicotyledonae)
Order- ales (Parietales)
Family- aceae (Brassicaceae)
Genus- Raphanus (no fixed suffix)
Species- sativus (no fixed suffix)

- Effective and Valid Publication

Name of new taxa must be published effectively and validly to have recognition in the systematics community under the ICN.

➢ Effective Publication: is publication which is accordance with the rules(i.e. printed matters has to be distributed to the general public or at least to botanical institutions with libraries accessible to botanist generally).

➢ Valid Publication: is a publication that is accordance with the rules i.e.

❖ Have a latin diagnosis or description.
❖ Give a clear indication of rank.
❖ Designate a type & its location.
❖ Publish in a scientific journal.

- Publication of a new name of the rank of family or below on or after 1st January, 1958 is not considered valid if the type is not indicated.

- He who first validly published the name of a taxon is the author of that name. It is necessary to cite the name of the author after the name of the taxon.

- The name of a taxon below the rank of a genus is not validly published unless the name of the genus or species to which it is assigned is validly published.

- **Rejection of name**

A legitimate name is one in accordance with the rules of botanical nomenclature, while those which do not satisfy the rules are known as illegitimate names.
Some rules are framed for the rejection of names:

- **Synonym**

In botanical nomenclature, a synonym is a name that is not correct for the circumscription, position, and rank of the taxon as considered in the particular botanical publication.*Pinus abies* (L) is a synonym of *Picea abies* (L).

- **Homonym**

It is the same name given to other taxon and should be rejected. The later homonym *Myroxylon* L.f. (1782), in the family Leguminosae, is conserved against the earlier homonym *Myroxylon* J.R.Forst. & G.Forst. (1775) (now called *Xylosma*, in the family Salicaceae).

Superfluous name

The name which is given to a taxon when already some name is present in existence is called superfluous name. The superfluous names must be rejected. The generic name *Cainito* Adans. (1763) is illegitimate because it was a superfluous name for *Chrysophyllum* L. (1753), which Adanson cited as a synonym.

Basionym

Basionym means the 'original name'. The term is primarily used in botanical nomenclature, the scientific naming of plants.For instance, when the binomial name of a species has been changed, the earliest name is the basionym. For example, the basionym of the name Picea abies is Pinus abies.

Tautonym

It is the specific epithet repeats exactly the generic name and must be rejected (not applicable for zoological nomenclature). e.g. *Larix larix* is a tautonym.

Nomen nudum

The names which are published without any description, called nomen nudum and are rejected until published with proper description. e.g. *Veronica sutherlandii*.

- Author citation

In botanical nomenclature, author citation refers to citing the person or group of people who validly published a botanical name, i.e. who first published the name while fulfilling the formal requirements as specified by the *International Code of Nomenclature for algae, fungi, and plants* (*ICN*).

- Author name is given after the name of the taxa.

e.g. *Maesopsis eminii* Engler.

- The author's name should be abbreviated unless it is short.

e.g. Linnaeus – L.

Lamarck – L.

- If the first author failed to describe and the second author described and validly published then both the names should be written after the species name using the term 'ex'.

  e.g. *Andropogon aromaticus* Sieber ex Schult.

- The original name for a species is *Panicum dactylon* Linn. When C.H. Persoon changed the genus name to *Cynodon*, while the species name remain same then the origin author's name is placed in bracket.

  e.g. *Cynodon dactylon* (Linn)Pers.

- When two or more authors suggest a scientific name, their names are linked by ‘et’.

  e.g. *Delphinium viscosum* Hook.f et Thomson.

- When father and son both are authors, the letter ‘f’ may follow the name of the son.

  e.g. Oldenladia wightii Hook. f.

- The diagnostic characters of a taxon altered sufficiently while the attribution of the name to the original taxonomic concept as named is insufficient. The original authorship attribution is not altered in these cases, but a *taxonomic* statement can be appended to the original authorship using the abbreviation "emend.”

  e.g. *Phyllanthus* L. emend. Müll. Arg.

- Name of Hybrid Taxa

In botanical nomenclature, a hybrid may be given a **hybrid name**, which is a special kind of botanical name, but there is no requirement that a hybrid name should be created for plants that are believed to be of hybrid origin.

- Hybrids are indicated with the 'x' sign.
- The sign may be given in two form:
  - Where the parental taxa are indicated.

    e.g. *Quercus alba* L. x *Q. michauxii* Nutt.
  - Where the hybrid taxon is given a new name.

    e.g. *Quercus x beadlei* Trel.ex.E.J.Palmer

THANK YOU