

# **BINOMIAL NOMENCLATURE**

# Definition

- Naming of plants
- Need universal name for all species because -
  1. Common name of plant varies from place to place

**Paddy – nelli – tamil**

**Vrihi – sanskrit**

**Dhan – hindi**

**Vadlu – telugu**

**Dangar - Gujarathi**

2. Single common name for two different species

- Eg. Brahmi – *Centella asiatica* and *Taxus baccata*

3. Single common name for two different species in International names also

- Eg. Butter fruit – *Diospyrus discolor* and *Persea americana*
- It creates **confusion** in using plant names

# Binomial Nomenclature

- Naming of Plants by **two names**
- It consists of two epithets [words] – **Generic epithet and Species epithet**
- It was first introduced by **Linnaeus in 1751**

## How to write

- Genus comes first
- Species follows next
- Should be in Greek or Latin
- The name relates the plant
- Genus name should be capitalized
- Species name should be in small letter
- It should be italicized or underlined

# Advantages

- Binomial names are universal names for plants
- Definite and precise names
- Describes the main features of the plant
- Greek and Latin names are internationally known
- Easy to arrange plants based on their systematic relationships

# **International code of nomenclature [ICN]**

- Formerly called **International code of Botanical nomenclature [ICBN]**
- Name changed in **International Botanical congress in Melbourne in July 2011**
- It was first introduced by **Linnaeus in 1751 – Philosophia Botanica**
- Detailed account of botanical nomenclature **De Candolle in 1813 – Theorie elementaire de la botanique**
- It is the very **basis** for the **first International congress in 1867, Paris**
- This law of botanical nomenclature is called **Paris code, 1867** or **De Candolle's rule**

# Codes of Nomenclature

## 1. Paris Code (1867)

The first organized efforts to *standardization and legislation* of nomenclatural practices were laid down at the *first International Botanical Congress*, Paris in August 1867

### **Agreeing rules -**

1. Linnaeus rules of Nomenclature
2. Rule of Priority
3. Author citations
4. Rules for acceptance and rejection of names

## **2. Rochester code (1892)**

Developed *by N.L. Britton, New York Botanical garden, Rochester, USA.*

*American Association of Advancement in Science*

### **Agreeing rules**

1. Types as a scientific and fundamental basis
2. Rules of priority
3. Acceptance of tautonomy



### **3. Vienna code (1905)**

*Third international Congress, Vienna, Austria, in June 1905*

#### **Agreeing rules**

1. Linnaeus "***Species plantarum***" as the starting point for Nomenclature
2. Generic name should be conserved called "***Nomina generica conservanda***"
3. ***Latin diagnosis*** should be accompanied for the names
4. ***Tautonomy*** was not accepted
5. ***Date of Publication*** was alone accepted for priority

# Leningrad code

- The Paris code has been **modified and refined** at each International Botanical Congresses
- The present International code of Botanical Nomenclature is the outcome of the **12<sup>th</sup> International Botanical Congress held in Leningrad, USSR in August 1975**
- This is known as **Leningrad code**.
- Leningrad code has three parts
  - *Principles*
  - *Rules*
  - *Recommendations*

## *Principles*

- **Needs** for the code
- **Independence** of Botanical Nomenclature from Zoological nomenclature
- **Categories of names** of taxonomic groups [Taxa]
- **Priority** for nomenclature in naming of plants
- **Latin** words as the basis of scientific names
- **Limitations to nomenclature** in naming of taxonomic groups or taxa
- **Conservation of old names**
- **Application of ICBN** for all forms of plant life

# *Rules of ICBN*

## **Chapter II: Categories of Taxa and Terms Denoting them**

– It includes **4 articles**

- **Article – 1** – defines the taxa as taxonomic group of any rank.
- **Article – 2 to 4** – discuss the names of different ranks of taxa.

- **Kingdom**
- **Division**
- **Sub – division**
- **Class**
- **Sub – class**
- **Order**
- **Sub – order**
- **Family**
- **Sub – family**
- **Tribe**
- **Genus**
- **Sub - genus**
- **Species**
- **Sub – species [ssp.]**
- **Varietas [var.]**
- **Subvarietas [subvar.]**
- **Forma [f.]**
- **Clone [cl.]**

## Chapter III – Names of taxa

- It contains **15 sections** dealing with Nomenclature rules

### a. Section – 1

- **To refer a plant with a name**
- It should be **given** according to the **rules of ICBN**

### b. Section – 2

- Deals with **type method**
- It composed of **5 articles**
- **Lower rank** used as **type** for knowing **the higher rank**
- Type specimen is **herbarium species**

## ***Some important nomenclatural types***

- **Holotype** – ***herbarium specimen*** as nomenclatural type
- **Isotype** – ***additional copies*** of holotype made by the author
- **Lectotype** – ***Fresh herbarium*** made from ***original plant materials*** when holotype is missing
- **Neotype** – ***Fresh herbarium*** specimen made ***after publication***
- **Syntype** – One of the ***herbarium specimens*** of a species used by the author when
  - » *no holotype was designated* or
  - » *parts of a plant were made into two or more herbarium specimens*

### **c. Section – III**

- This section is composed of **4 articles**
- It says that names have **no claim** to recognition by botanists unless **validly published**
- In the case of **Phanerogams**, names published **after 1<sup>st</sup> May, 1753** are **accepted** by nomenclatural rules
- However, **oldest names** may also be **conserved**, if they have been in **common use for a long time.**



## Section 4

- This section deals with **nomenclature of taxa.**

### ***1. Names of Taxa above the rank of family***

- Name of the order must be **taken from one of its families**
  - Division should end in – **phyta**
  - Sub division end in – **phytina**
  - Classes should end in – **opsida**
  - Subclasses should end in – **idae**
  - Orders should end in – **ales**
  - Suborders should end in – **ineae**

## ***2. Names of Taxa above the rank of Genera***

- The names of families, subfamilies, tribes and subtribes are taken from the names of their lower taxa.
- For Eg. The family name *Annonaceae* is taken from one of its genera, *Annona*
  - Families should end in – **aceae**
  - Subfamilies should end in – **oideae**
  - Tribes should end in – **eae**
  - Subtribes should end in – **inae**

### ***3. Names of genera and subgenera***

- They may be **taken from any source**, but they should have some **relevance** to the plants.

### ***4. Names of species***

- Species name is the **second epithet** of the binomial system.
- It is taken from **any character or special feature** of the plant

Eg.

- ***indica*** [common in India]
- ***cordifolia*** [heart shaped leaf]
- ***racemosa*** [racemose inflorescence]
- ***terrestris*** [land plant]
- ***hreedii*** [name of a taxonomist]

- Name of some species is composed of two words.
- If so, the two words are hyphenated Eg. ***Hibiscus rosa – sinensis***
- If the generic and species name are same – ***Tautonyms*** Eg. ***Linaria linaria***

## ***5. Names below the rank of species***

- Names of subspecies are given after the species epithet in the same way as the species names were considered.
- In the case of varieties, the abbreviation ***var.*** is given
- ***Eg. Oryza sativa communis*** [Long grained]  
***Oryza sativa brevis*** [short grained]  
***Oryza sativa communis var. indica***

## 6. Names of Hybrids

- In the case of hybrids, parents of the progeny is given in citation after its varietal epithet
- Eg. *Oryza sativa communis var. italica*  
[VIR 4550,Italy X Dubosky 129]

## 7. Name of Plants in Cultivation

- The same species name is to be used for cultivated plants and their wild ancestors

## Section – 5

- It says that plant names should be **published** by exchange of printed matters [in journals or booklets]

## Section – 6

### *Conditions of valid publications*

- a. The publication must be **effective**
- b. It should be **accompanied** by a **description or reference** explaining the **diagnosis** of the taxa
- c. should be accompanied by a **Latin description**
- d. A **photograph or figure** of the new species should be accompanied
- e. This system should **follow since January 1958**



## Section – 7

### *Citations and author names*

- Author names is given after the name of the taxa

- It enables us to understand the name of the taxa

Ex:

–*Liliaceae* Adanson

–*Mangifera* Linnaeus

–*Maesopsis eminii* Engler

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

Ex:

- Linnaeus – L.
  - Rothmaller – Roth.
  - Roxburgy – Rox.
  - Lamarck – Lam.
- If the **first author failed to describe and the second author described** then both the names should be written after the species name

Ex:

***Capparis lasiantha*** R. Br ex DC

- R. Br is Robert Brown – first named the plant
- ex – explained by
- DC – De Candolle

- If a plant is named by **more than two authors** and described by another author, the authors who named it is put in citation

Ex:

***Oldenlandia affinis*** [Roemer and Schultes] DC

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

Ex:

***Oldenlandia wightii*** Hook. f.

- That is Sir J.D. Hooker and his father.

## Section – 8

### *Retention of Genus Names*

- If a genus is divided into two or more genera, the **original name should be retained** in the taxa in which the type specimen occurs.

## Section – 9

### **Retention of species Names**

- When a species of one genus is transferred to another genus, the genus epithet is changed but the species epithet is retained

Ex

- *Pinus laricina* transferred to *Larix laricina*

## Section – 10

- When two or more taxa of the same rank are united, the oldest name or the author's choice may be retained

Ex.

- When the three genera, **Solanea**, **Echinocarpus** and **Phoenicosperma** are united, the name Solanea was retained for the genus.

- It was **author's choice**.

## **Section – 11: Changing the names when rank of the Taxon is changed**

- It states that the earliest name should be given to the taxa when –
  - A tribe is converted into a family
  - A subgenus is converted into a genus
  - A subspecies is converted into a species

## **Section – 12**

- The names of the plants should not be rejected or changed even if they are –
  - Badly chosen
  - Disagreeable
  - Difficult to use
  - Less known

**Rejection of names if it was illegitimate**

## Recommendations

- This section recommends to use ICBN to bring out a **uniformity of nomenclature world – wide.**

**THANK YOU**