PLANT DIVERSITY

Taxonomy :

Taxis = orderly arrangement, nomos = law → Taxonomy is the body of principles and procedures classification.

This word was produced by **A.P. de. Candolle** in his book **"Theories elementaire de la botanique"** (Theory of elementary botany)

Taxonomy includes study of following 4 points

(1) Identification - Identification of living organisms

(2) Nomenclature - Nomenclature of living organism

(3) Classification - Classifications of living organisms in groups

(4) Affinities - Study of inter relationship between living organisms

Systematics : (Branch related with taxonomy)

(1) The term "Systematics" was proposed by Linnaeus

(2) In includes description of external morphological characters of plants or living organisms.

eg. Morphological characters of Root, Ste, Leaves, Flowers

(3) This description is used to know inter relationship among plants or living organisms.

New systematics or Neo systematics or Biosystematics :

(1) Neo - systematics - A new branch - Name given by Julian Huxley (1940)

(2) In includes description of all the characters (internal including morphological characters (external) of plants or living organism.

eg. Anatomical characters
Cytological characters

(3) It is used to know the inter relationship among living organism.

Note : New systematics is mainly based on evolutionary as well as genetic relationship (experimental taxonomy) as compared to morphological characters.

Some Informations :

- Maximum diversity found in tropical rain forests.
- Second maximum diversity found in coral reefs
- Practical significance of taxonomy is → Identification of unknown organism.

NOMENCLATURE

Polynomial system :

According to this system name of any plant consists of many words.

For eg. Caryophyllum-Caryophyllum sexatilis folis gramineus unbellatis corymbis

Binomial system :

(1) Binomial system was first proposed by **Gaspard Bauhin** in his book - "Pinax Theatre Botanica"

(2) **Carolus Linnaeus :** Linnaeus used this nomenclature system for the first time on large scale and proposed scientific name of all the plants and animals.

- Linnaeus is the founder of binomial system.
- Linnaeus proposed scientific name of plants in his book **"Species plantarum"**. It was published on 1 May 1753. So this was the initiation of binomial system for plants. So any name proposed (for plants) before this date is not accepted today.
- Linnaeus proposed scientific name of animals in his boo "Systema naturae" (10th edition).
- This 10th edition of **Systema naturae** was published on 1 August 1758. So initiation of binomial system for animals is believed to be started on 1 Aug 1758.

Principle of Priority :

The nomenclature is done by principle of priority. If two names re proposed for any plant after the 1753, the valid name is the earlier name proposed just after 1 May, 1753.

ICBN

"International Code of Botanical Nomenclature"
ICBN - Book of rules of nomenclature

- Collection of rules regarding scientific - nomenclature of plants is known as ICBN.
- ICBN was firstly proposed by -

Sprague, Hitchcock, Green (1930)

- 12th International congress, Leningrade, revised ICBN in 1975.
- After revision it was republished in 1978. So that ICBN was published two times
  (1) 1961 (2) 1978

Main rules of ICBN :

(1) According to binomial system name of any species consists of two names -
  (i) Generic name - Name genus
  (ii) Specific name - Trival name
  e.g. ***Solanum tuberosum*** (Potato) ***Mangifere indica*** (mango)

  ↓ ↓ ↓ ↓

  Generic name Specific name Generic name Specific name

(2) In plant nomenclature (ICBN) tautonyms re not valid e.g. generic name and specific name should not be same in plants.

e.g. Mangifera mangifera

But tautonyms are valid in animals nomenclature (ICZN-International Code of Zoological Nomenclature)

e.g. Naja naja (Indian cobra), **Rattus rattus** (Rat)

(3) Length of generic name or specific name should not be less than **3** letters and not more than **12** letters.

eg. *Mangifera indica*

Exception - *Riccia pathankotensis*- More than 12 letters.

According to ICBN this name is not valid but his name was proposed before 1961, so it is valid.

(4) First letter of generic name should be in capital letter and first letter of specific name should be in small letter.

eg. ***Mangifera indica***

But if specific name is based on the name of some person, its first letter should be in capital letter.

eg. ***Isoetes Pntti***

(5) When written with free hand or typed, then generic name sand specific name should be separately underlined. But during name shold be italized.

(6) Name of scientist (who proposed nomenclature) should be written in short after the specific name

eg. ***Mangifera indica*** Lin.

(7) Name of scientist should e neither underlined nor written in italics, but written in roman letters (simples alphabets)

(8) If any scientist has proposed wrong name then his name should be written in bracket and the scientist who corrected the name should be written after the bracket.

eg. ***Tsuga candensis*** (Lin.) Salisbury

Note : Linnaeus names this plane as ***Pinus Canadensis***

(9) Scientific names should be derived from Latin or Greek languages because they are dead languages.

(10) Type specimen (Herbarium Sheet) of newly discovered plant should be placed in herbarium (Dry garden).

(11) Standard size of herbarium sheet is 11.5 × 16.5 inches.

Type specimen (Herbarium sheet) are of different type

Holotype - Herbarium sheet on which the first description of plant is based.

Lectotype - In case of holotype is lost, second herbarium sheet prepared from the original plant is called lectotype.

Neotype - In case of holotype and original plant is lost, then herbarium sheet prepared from some other plant o same species is called neotype.

Syntype - In case of holotype and original plant is lost then many herbarium sheet prepared from many plant of same species is called syntype.

Isotype - Duplicate of holotype - In presence of holotype a second herbarium sheet prepared from the original plant is called isotype.

Paratype - Additional herbarium sheet used in the first description of plant is called paratype. It is prepared from some other plant of same species having some variations.

Note : Nomenclature is invalid in absence of Herbarium sheet.

ICNB = International Code of Nomenclature for Bacteria

ICVN = International Code of Viral Nomenclature

ICCP = International Code of Nomenclature for Cultivated Plants.