TOPIC: SYSTEMATICS AND BINOMIAL SYSTEM OF NOMENCLATURE

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TAXONOMY

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Taxis = orderly arrangement, nomos = law

Taxonomy Definition: "Taxonomy is the study of principles and procedures of classification."

Plant Taxonomy includes the study of following 4 points:

(1) **Identification:** Identification of living organisms
(2) **Nomenclature:** Nomenclature of living organisms
(3) **Classification:** Classification of living organisms in groups
(4) **Affinities:** Study of inter relationship between living organisms.

SYSTEMATICS

(Branch Related with Taxonomy)

"Systematics is a branch of Biology that deal with cataloguing plants, animals and other organisms into categories that can be named, remembered, compared and studied."

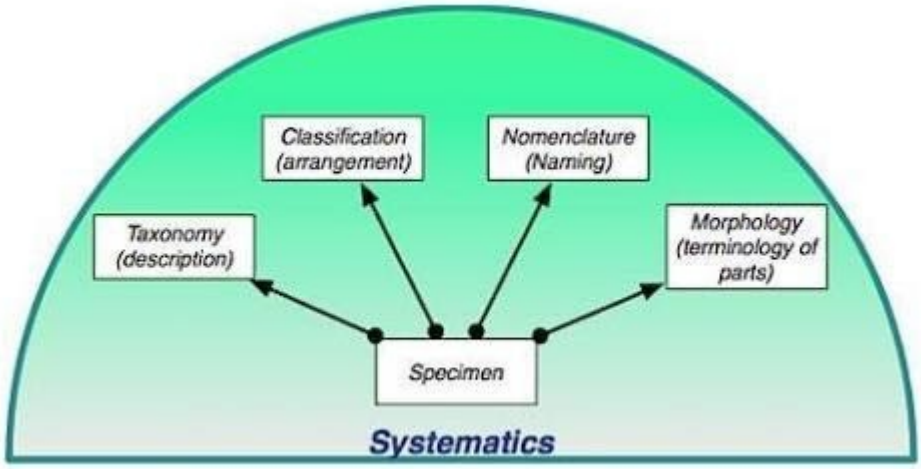

Fig: Systematics

- Study of only one organism of a group provides sufficient information about the remaining members of that group. Scientists

connected with the study of systematics are called systematists or taxonomists.

- The term "Systematics" was proposed by Linnaeus.
- It includes a description of external morphological characters of plants or living organisms.
  Example: Morphological characters of Root, Stem, Leaves, Flowers.

Basics of Systematic Study

1. **Characterization:** The organism to be studied is described for all its morphological and other characteristics.

2. **Identification:** Based on the studied characteristics, the identification of organism is carried out to know whether it is similar to any of the known group or taxa.
3. **Classification:** The organism is now classified on the basis of its resemblance to different taxa. It is possible that the organism may not resemble any known taxa or groups. A new group or taxon is raised to accommodate it.

4. **Nomenclature:** After placing the organism in various taxa, its correct name is determined. If the organism is new to systematics, it is given a new name based on rules and conventions of nomenclature.

Fig: Difference between Systematics and Taxonomy

NOMENCLATURE

1. Polynomial system:

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

- For eg. Caryophyllum–Cqryophyllum saxatilis folis gramineus umbellatis corymbis

2. Binomial system:

- Binomial system was first proposed by Gaspard Bauhin in his book - "Pinax Theatre Botanica."
- Principle of Priority: The nomenclature is done by principle of priority. If two names are 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):

Fig: ICBN full form

- 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)
- ICBN was first accepted in 1961.
- 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
- ICNB = International Code of Nomenclature 'for Bacteria
- ICVN = International Code of Viral Nomenclature
- ICNCP = International Code of Nomenclature for Cultivated Plants

MAIN RULES OF ICBN

- According to binomial system name of any species consists of two names:
  (i) Generic name - Name of genus
  ii) Specific epithet - Trival name
  Example: Specific Name - Mango; Generic Name - Mangifera indica
- In plant nomenclature (ICBN) tautonyms are not valid i.e. generic name and specific name should not be same in plants.
  Example: Mangifera Mangifera
  But tautonyms are valid in animal nomenclature (ICZN-International Code of Zoological Nomenclature). **Example:** Naja naja (Indian cobra), Rattus rattus (Rat)
- Length of generic name or specific name should not be less than 3 letters and not more than 12 letters.
  Example: Mangifera indica
- First letter of generic name should be in capital letter and first letter of specific name should be in small letter.
  Example: Mangifera indica
  But if specific name is based on the name of some person, its first letter should be in capital letter.
  Example: Isoetes Pantii

- When written with free hand or typed, then generic name and specific name should be separately underlined. But during printing name should be italized.
- Name of the scientist (who proposed nomenclature) should be written in short after the specific name.
  Example: Mangifera indica Lin
- Name of the scientist should be neither underlined nor written in italics, but written in roman letters (simple alphabets).
- If any scientist has proposed wrong name then his name should be written in the bracket and the scientist who corrected the name should be written after the bracket.
  Example: Tsuga canadensis (Lin.) Salisbury
  Note: Linnaeus named this plant as Pinus canadensis.
- Scientific names should be derived from Latin or Greek languages because they are dead languages.
- Type specimen (Herbarium Sheet) of newly discovered plant should be placed in herbarium (Dry garden).
- Standard size of herbarium sheet is 11.5 × 16.5 inches.

3. Trinomial system:

- Proposed by Huxley and Stricklandt. According to this system name of any plant or species is composed of three names -
  (i) Generic name
  (ii) Specific name
  (iii) Subspecific name (Name of variety)
- When members of any species have large variations then trinomial system is used. On the basis of dissimilarities, this species is classified into sub species.
  Example: Brassica oleracea var. botrytis (Cauliflower), Brassica oleracea var. capitata (Cabbage), Brassica oleracea var. caulorapa (Knol-Khol)

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