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AN INTRODUCTION TO PLANT TAXONOMY

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**BOTANY: SEM- II, PAPER: GE-2: PLANT ECOLOGY AND TAXONOMY, UNIT 6: INTRODUCTION TO
PLANT TAXONOMY.**



DIVERSITY-

- Biological diversity refers to the global variety of species and ecosystems and the ecological processes of which they are part, covering three components:
 - genetic,
 - species,
 - and ecosystem diversity.

Why Classify?

- There are more than 2.5 million different living things on earth.
- Millions more have not yet been discovered.
- Life is diverse and needs to be organized.
- It is organized so that scientists all over the world have a universal method of classifying.
- Organisms are placed into groups with biological similarities.

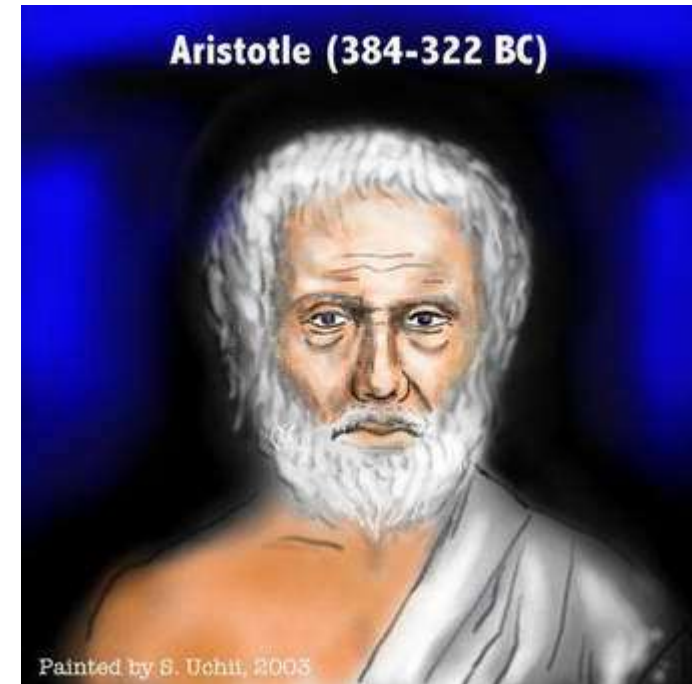


Classification-

- Taxonomy = science of naming and classifying organisms
- Aristotle —classified according to similar structures in plants and animals

History of Classification:

- **Aristotle - 2000 years ago**
- Plant on the basis of-
Stem differences
- or Animal on the basis of -
Land dweller
Water dweller
Air dweller





Problems with this early system:

- Some plants and animals couldn't be classified using this system.
- People also used common names.
 1. Common names - don't describe things accurately.
 - Example: Jellyfish is not a fish
 2. Same common name for different species.

Maple Trees = Silver Maple, Sugar Maple, &
Red Maple are each different species



Classification: Scientific Names

- Consists of genus (plural is genera) and species
- Genus is always started with a capital letter
- Species is always lower case
- Scientific names are italicized (or underlined) just as book titles are
- Examples: – *Quercus rubra*(red oak)
 - *Quercus phellos*(willow oak)
 - *Apis mellifera* (European honeybee)
 - *Homo sapiens*(humans)



Handwritten scientific names:

- Follow the same rules, and.....
- are always UNDERLINED!!!!

What is the basic concept of Binomial nomenclature?

The Botanical name of a species is a combination of generic name and a specific epithet eg. *Solanum nigrum*. The first word designates the genus of the plant, which is usually Noun and singular and latinized, and written with first capital letter. The second word designates the specific epithet, it is usually adjective latinized and written with small letter.



Taxonomy and Systematics-

Systematics means 'the science of organization and pattern of heritable relationships among the kinds and diversity of organisms.'

Taxonomy means 'a very substantial but imprecisely separated part of systematics, that is especially concerned with the production of formal classifications of living things on the basis of genetic relationships.'

Taxonomy in Greek means 'putting in order' and **systematics** means 'putting together.'



The role of taxonomy-

1. works out a vivid picture of the existing diversity of life on earth,
2. provides much of the information permitting a reconstruction of the history of life on earth,
3. reveals numerous interesting evolutionary phenomena,
4. supplies classifications which are of great explanatory value in biology.



Biological Classification Systems-

- All biological classification systems have three important characteristics:
- Single, universally accepted name to each organism,
- Organisms are placed into groups that have real biological meaning (shared characteristics),
- Established rules for grouping organisms.



Artificial system of Classification-

The system of classification which is based on one or a few easily observable character of plants such as habit, number of stamen are referred as artificial classification eg, -Linnaeus system of classification.

Natural system of classification-

The system of classification which is based on overall resemblance of gross morphology, Floral character etc. is referred as Natural system eg. Bentham-Hooker's system of classification.

Phylogenetic system of Classification-

The system of classification which is based on overall resemblance of gross morphology and the taxa are arranged vertically on the basis of evolution is referred as phylogenetic classification.

eg. Cronquist's system of classification.



Aims and objectives of ICBN-

To avoid any ambiguous name of a plant species, a code was framed which is known as ICBN.

The main aim of the code are-

- (i) A plant name should be one irrespective to locality or nation.
- (ii) The name should be correct and unambiguous. ICBN is the acronym of International Code of Botanical Nomenclature. It is an international system and rule for correct and unambiguous name of a species concerned. These rules or code are called ICBN. ICBN has some principles and same rules.



PRINCIPLES-

- (i) Botanical nomenclature is independent of zoological and bacteriological nomenclature. The code applies equally to name of taxonomic groups treated as plants whether or not these group was originally treated.
- (ii) The name of a taxon is determined by means of nomenclatural types.
- (iii) The name is based upon priority of publication.
- (iv) Each taxon with a particular circumscription, position, and rank can bear only one correct name, which is earliest according to rules except some specific cases.
- (v) Scientific names are treated as Latin.
- (vi) The rules are retroactive unless expressly limited.



The rules of ICBN-

1. The rules of priority
2. Rank of taxa
3. Typification
4. Effective and Valid publication
5. Author citation
6. Rejection of names.



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