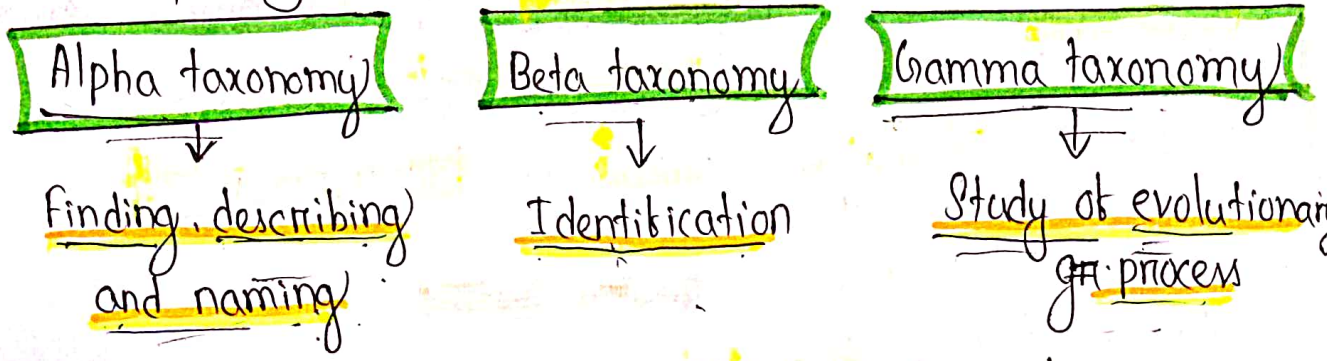


Taxonomy

Taxonomy - (Identification - (placement of organism in groups)
Nomenclature - (Naming the organism according to rules)
Classification - (Ordering the organism in groups))

Levels of taxonomy



Systematics - Process of organizing taxonomic information.

Systematic biology - Systematics and taxonomy

Nomenclature :-

- formal naming of organism according to rules.

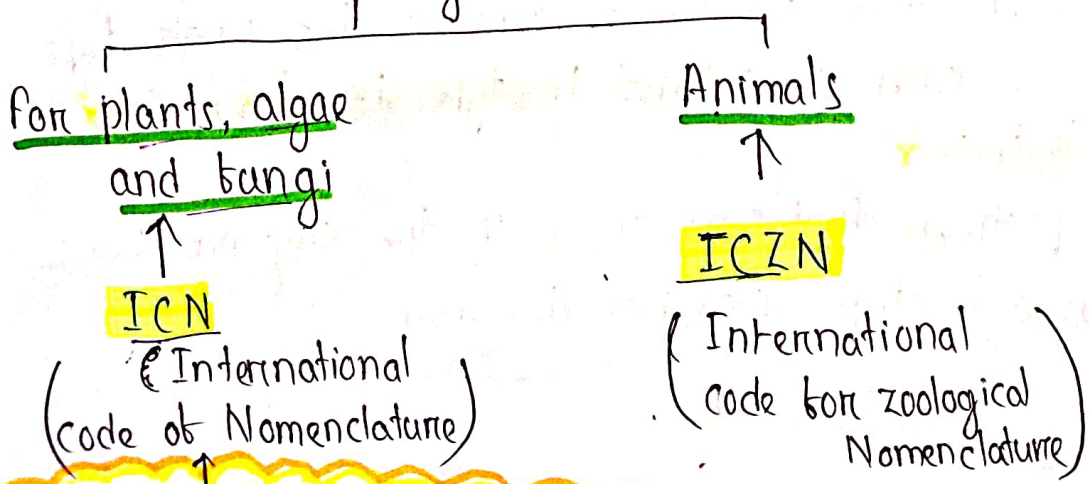
↑
Scientific name

also has common names

↑ Vernacular names

↓
Criteria for scientific naming

Used by people within a limited geographical region



(International code of Nomenclature)

(International code for zoological Nomenclature)

ICBN (International Code for Botanical Nomenclature)

Carolus Linnaeus: - Father of taxonomy

↓
Binomial nomenclature / binary nomenclature

↑ - 2 names

Italicized
or
underlined.

① Genus name / generic name - Start - Capital letter

② Species name / specific name - small letters
(Species epithet)

Example :-

Mangifera indica or Mangifera indica

↑ ↑
genus specific epithet

Abbreviation.

M. indica

Tautonym :- same genus and species.

- Only in zoological nomenclature.

Ex. Rattus rattus

Nomenclature type :-

① Holotype :- Specimen or illustration upon which name is based. (Original)

② Isotype :- Duplicate specimen of holotype.

(collected by same person from same population)

③ Lectotype :- Specimen that is selected from original material.

④ Neotype :- Specimen later selected to serve as the single type specimen when an original holotype has been lost or destroyed.

⑤ Syntype - Any specimen that was cited in the original work when a holotype was not designed.

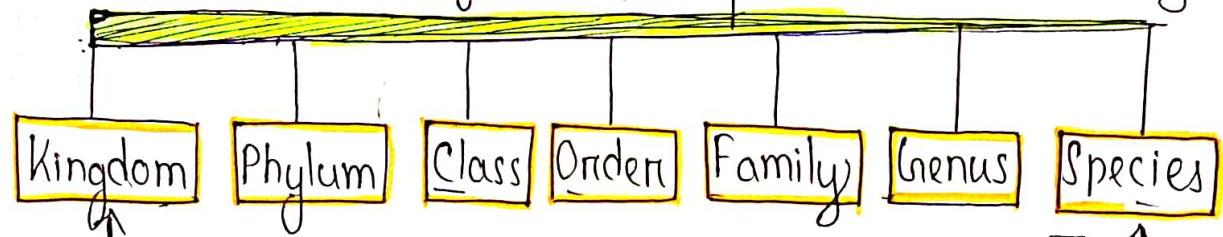
Classification

Provide system for expressing relationships between groups.

Taxonomic category - unit of classification

Taxonomic hierarchy → Taxon - means group

Linnaean classification system 7 taxon or taxonomic categories



Largest unit of classification

Smallest unit of classification

Number of organism decreases



Similarities between organisms increases

Biological species concept

Species - fundamental natural unit.

Defines species in terms of interbreeding

Groups of interbreeding natural populations that are reproductively isolated from other such groups.

Sibling species :-
/ Cryptic species
Morphologically similar
but reproductively isolated.

Subspecies :-
Having some special phenotypic characters due to origin or location but not reproductively isolated.

The five-kingdom system

Robert H. Whittaker

- 5 kingdoms
- * Monera
 - * Protista
 - * Fungi
 - * Plantae
 - * Animalia

Criteria

- 1) Level of organization
- 2) Method of nutrition

* Prokaryotes
Monera

* Eukaryotes

* Unicellular
Protista

* Multicellular

Heterotrophic by absorption
Fungi

Photoautotrophic
Plantae

Heterotrophic by ingestion
Animalia

Monera - Prokaryotic

Protista - Unicellular, Eukaryotes, Hetero

Fungi - Multicellular, Eukaryotes, Heterotrophic, absorption

Plantae - Multicellular, Eukaryotes, Photoautotrophic

Animalia - Multicellular, Eukaryotes, Heterotrophic, ingestion

Protists

← Unicellular, eukaryotic

Ernst Haeckel

- Sexual as well as asexual reproduction
- Free living or symbiotic
- Autotrophs, heterotrophs nutrition

Grouping

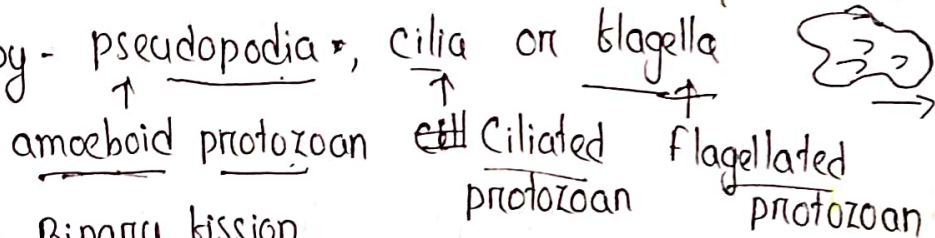
(mode of reproduction, method of nutrition and motility)

mixotrophs

- 1) Animal-like protists - Protozoa
- 2) Plant-like protists - Algae, phytoplankton
- 3) Fungus-like protists - Slime molds and water molds.

1) Protozoan protists :- Unicellular heterotrophs by ingestion
Protozoa - first animals

- Unicellular
- Aquatic, free living or parasitic
- Heterotrophic
- Locomotion by - pseudopodia, cilia or flagella



- Reproduction - Binary fission
- Budding
- Multiple fission.

Protozoan disease - 1) Amoebiasis - Entamoeba histolytica
2) Malaria - Plasmodium vivax

2) Photosynthetic protists - phytoplankton

Examples - (i) Dinoflagellates

- marine
- biflagellate
- spinning type locomotion - whirling whips
- chlorophyll a & c
- symbionts - zooxanthellae
- reproduction asexual by longitudinal division



- (ii) **Diatoms** :- Chief producers in oceans
- both marine & freshwater
 - cell wall (bustule)



- lack flagella
- reproduction asexual by binary fission

- (iii) **Euglenoids** :-
- Unicellular flagellated protists
 - Fresh water
 - cell wall - (pellicle)
 - 2 flagella - unequal size
 - mixotrophic
 - longitudinal binary fission.

③ **Fungus like protists** :-

- (i) **Slime mold** - Heterotrophic

Fungi and Protozoa

production of spore locomotion & ingestion of food



- (ii) **Oomycetes** :- Egg fungus, water molds
- do not have cell wall made up of chitin
 - absorption of food.