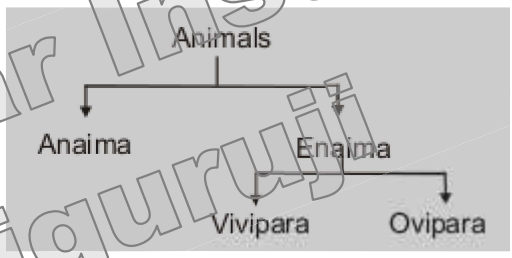
Topic: Taxonomy Basics

- Taxonomy is the branch which deals with the study of nomenclature, classification and their principles.
- Taxonomy word was given by "A.P. de Candole. It is a Greek word.
- Taxis – arrangements. Nomos – Law.

Father of modern Taxonomy - Carolus Linnaeus

1. Aristotle

- He is called as the Father of Zoology. He is also known as the Father of ancient animal – Classification
- He classified first of all the known animals of his times into two groups on the basis of their natural similarities and differences & blood colour in his book **Historia animalium**.
- These groups were Anamia & Enaima.
    - **Anaima -** Animals without red blood cell. e.g. Sponges, Cnidaria, Mollusca, Arthropoda, chinodermata.
    - **Enaima -** These animals have red blood. This group includes all vertebrates and it has been further divided into two subgroups :-
- **Vivipara :** Which give birth to young-ones. e.g. Man, Whale and other mammals.
- **Ovipara :** Which lay eggs. e.g. Amphibians, Pisces, Aves, Reptiles etc.



2. Pliny

- He classified animal into two groups:-
    - **Flying -** Animals which can fly.
    - **Non-Flying -** Animals which cannot fly.

John - Ray : He defined the term "species". He first used the term "species". The smallest unit of classification is the species.

- **Mayer (**Darwin of 20th century**): -** Gave the modern definition of animal-species. According to him, the group of animals which are capable of interbreeding in natural conditions are of the same species.

3. Carolus Linnaeus

- The Binomial system of Nomenclature was extensively used by Linnaeus.
- It was developed by Gasperd Bauhin (1735).
    - Species Plantarum is a book by Carl Linnaeus, originally published in 1753, which lists every species of plant known at the time, classified into genera. It is the first work to consistently apply binomial names and was the starting point for the naming of plants.
    - Genera Plantarum is a publication of Carl Linnaeus. The first edition was issued in Leiden, **1737**. **The fifth edition served as a complementary volume to Species Plantarum (1753).**

- In 1758 in the 10th edition of book "Systema Nature" he gave the classification of known 4236 animals
- each name have 2 parts:-
  - First part is genus and second part is species name.
  - First alphabet of genus is written in capital & rest in small.

- **Linnaeus classified animal kingdom into 6-classes on the basis of structures. It was an artificial classification**:

1. Mammalia
2. Aves
3. Amphibia
4. Insecta
5. Pisces
6. Vermes

In 1901, in the International Zoology Congress, approved International rules for Binomial system.

- In 1961, certain modifications were made in the Binomial system. In certain species, sub-species are also found. Now three words are used. First is of genus second of species and third is of subspecies. The method of nomenclature of Sub-species is termed as the "Trinomial Nomenclature" and it was given by "Huxley and strickland". e.g. The name of Indian, Burmese and the Srilankan crow according to this system is-
  - *Corvus splendens splendens* – **Indian and Pakistani crow.**
  - *Corvus splendens insolens* – **Burmese crow.**
  - *Corvus splendens protegatus* - **Srilankan crow.**

- **"G.L. Cuvier" :** Gave the term "phylum & Sub phylum. New-systematics" word was proposed by Julian-Huxley.
- **R.H. Whittaker :** He gave the Five kingdom scheme of animal-classifications - as follows

Characters	Five Kingdoms				
	Monera	**Protista**	**Fungi**	**Plantae**	**Animalia**
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Noncellulosic (Polysaccharide + amino acid)	Present in some	Present with chitin	Present (cellulose)	Absent
Nuclear membrane	Absent	Present	Present	Present	Present
Body organisation	Cellular	Cellular	Multiceullar/ loose tissue	Tissue/ organ	Tissue/organ/ organ system
Mode of nutrition	Autotrophic (chemosyn-thetic and photosynthetic) and Hetero-trophic (sapro-phytic/para-sitic)	Autotrophic (Photosyn-thetic) and Hetero-trophic	Heterotrophic (Saprophytic/ Parasitic)	Autotrophic (Photosyn-thetic)	Heterotrophic (Holozoic/ Saprophytic etc.)

- **Storer And Usinger :** They gave the modern classification of the 5-kingdom system. In modern classification the animals have been classified into 10 major and 21 minor phylum.

Types of Species

- **Agamospecies :** The species which reproduce asexually are known as agamospecies.
- **Gamospecies :** The species in which inter breeding takes place are called gamospecies. It is also known as Biological species.
- **Sympathetic Species :** Two or more than two species occupying identical habitat or area are called sympathetic species.
- **Allopatric Species :** Two or more species which are inhabiting different geographical condition are called allopatric species.
- **Synchronic Species :** Two or more than two species which are found in same time period are called synchronic species.
- **Allochronic Species :** Two or more than two species that are found in different time period are called allochronic species.
- **Palaeo/Palaeontological species :** The species which are found in the form of fossils now a day are called palaeo species.
- **Neontological species :** The species which is present in living form, called neontological species.
- **Monotypic species :** Species that are not sub divided into subspecies are called monotypic species.
- **Polytypic species :** Species that contain two or more subspecies are called polytypic species.
- **Key stone species :** Species that which determines biotic structure of entire community by predation or any control mechanism.

Sequence of Classification

- Smallest unit of classification is "Species". It includes animals capable of interbreeding.
- Genus includes similar species.
- Family is made up of similar genera.
- Many families join together to form an order,
- many orders join together to form a class and
- many classes form a Phylum.
- All the phyla unite to form the largest unit Kingdom.

International Code of Botanical Nomenclature (ICBN)

- The International Code of Botanical Nomenclature is the set of rules according to which plants are given their botanical names (scientific names). The code specifies the standards and forms of names to be applied to each taxon of plants.
- According to the code May 1,1753, the date of publication of Linnaeus' *Species Plantarum*, is considered the starting point of present day nomenclature.