

Tutorial 01 B

Study Unit 1-3

Thanks for your involvement in making this group an interactive one. If you are yet to participate, Please do.

*As it has been mentioned in my welcome address that all the tutorials will be based on what the Lecturer has designed. Even though, I tried (and will try in subsequent ones) to simplify the module for the purpose of your understanding, I would like to say that **IT IS NOT EXHAUSTIVE IN ITSELF**. Hence, onus lies on you to study and study to ensure maximum achievement. To this effect, only highlight excerpt are presented here. This also will cut across all tutorials that I would be pasting on myunisa.*

What is taxonomy? Is the branch of biology that names, classifies species, formalizes this ordering of species into groups of increasing breadth based on the degree to which they share characteristics.

Taxonomy started with Linnaeus

Organisms share characteristic that depict a common ancestry among them

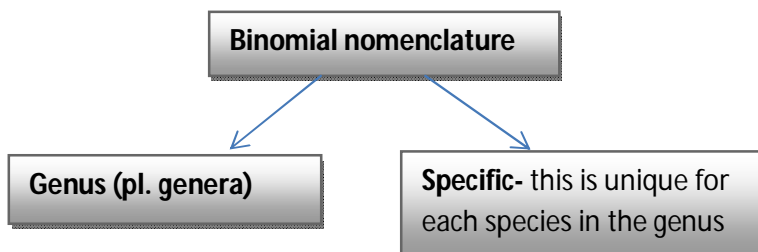
Phylogeny is the evolutionary history of a species or group of species e.g. Lizards and snakes are both scaly feet though snakes evolved from lizards with legs. However their legless condition is an independent evolutionary endeavour. Therefore Phylogenetic systematics is used for classification. Biologists use these three pieces of information in phylogenetic systematics:

- Fossils record
- Comparing anatomy of the organism
- Compare DNA

Phylogeny based on DNA data reveals that human is closer to mushroom than either of them to plant i.e. mushroom is closer based on DNA phylogeny to human than plants, likewise human closer to mushroom based on DNA phylogeny than plants as well.

What is the essence of phylogenetic systematics? It reveals evolutionary relationships

Binomial nomenclature is Latin scientific name given to organisms. It is binomial because it is in two parts. 'Bi' means two'



Example of a scientific name is *Homo sapien*. **Take Note:** the first word starts with capital letter others are small letters. Also, scientific name is always in italics.

Section 1.2

Hierarchical classification

Two ways to hierarchical classification: (1)Linnaean classification and (2)phylogenic classification

I. PHYLOGENY CLASSIFICATION

Phylogeny classification based on (a)morphology or based on (b)DNA

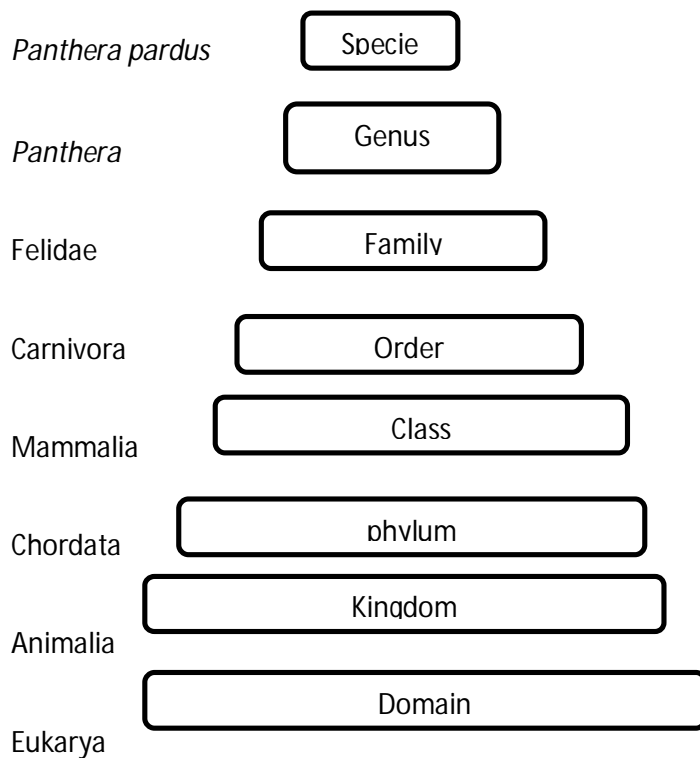
Clades are taxa from the same ancestral specie. A clade is the group of taxon in monophyletic group

Cladogram is the diagram that shows relationship between taxa

An outgoing group is a species or group of species from an evolutionary lineage that is known to have diverged before the lineage that includes the specie we are studying

- Shared and derived character

II. LINNAEAN CLASSIFICATION



Test your brain:

Which is the genus and which is the specie name in *Panthera leo*

Section 1.3

Principle of maximum Parsimony and maximum likelihood enable scientists to decide on the possible phylogenetic tree that is most correct among all the possible trees.

Principle of maximum Parsimony: first investigate the simplest explanation that is consistent with the facts

Principles of maximum likelihood: based on the established probability rate of change in DNA, the species that reflects most likely sequence of evolutionary event is classified in the same category