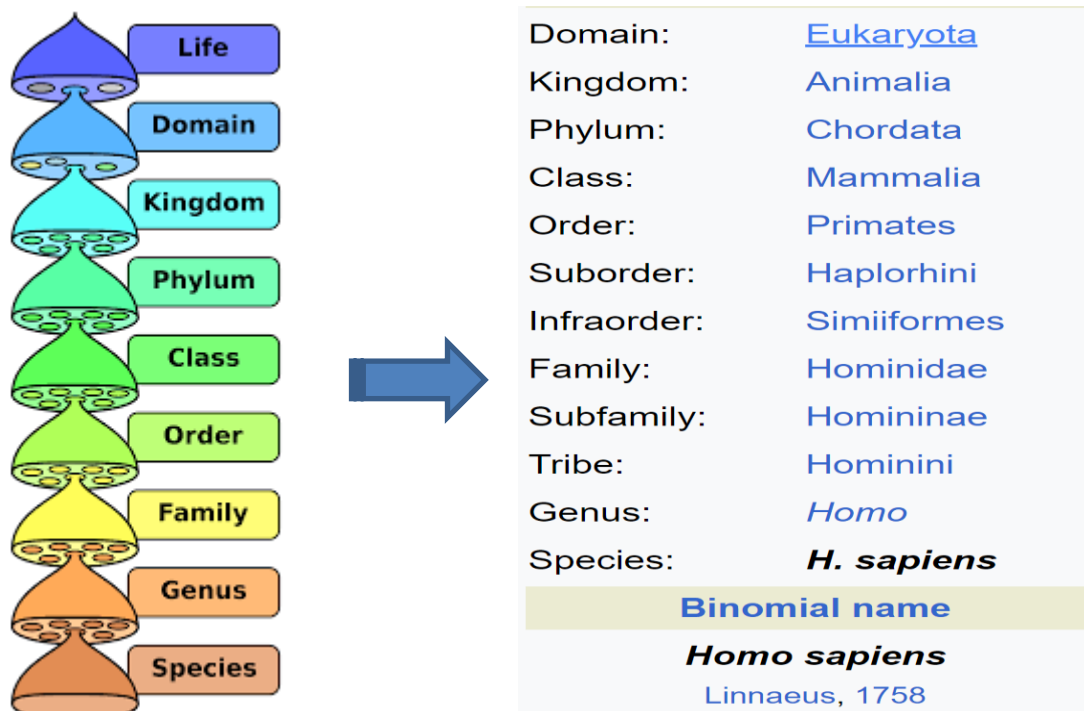


TP1 : Definitions and general concepts of Zoology

Zoology is a branch of biology dedicated to the study of animals. It encompasses various aspects of animal life, such as **anatomy**, **physiology**, **genetics**, **ecology**, **evolution**, and **animal behavior**. Zoologists not only study modern **animal species** but also examine **fossils** to understand the evolution of animals over time. They may specialize in specific groups of animals, such as insects (**entomology**), birds (**ornithology**), mammals (**mammalogy**), or reptiles and amphibians (**herpetology**). Zoology also plays a key role in **biodiversity** conservation and ecosystem management by studying the interactions between **animals and their environment**.

Zoology (from Zoon = animal, Logos = study) is the science dedicated to studying the animal kingdom. It draws from various disciplines, such as anatomy, histology, physiology, embryology, paleontology, ecology, and genetics, to assign animals their place in the grand tree of life (classification).



Suffix Taxons in systematics :

In biological systematics, the classification hierarchy uses suffixes to indicate the rank or level of each taxon. These suffixes provide consistency and help identify the rank of a group of organisms in the classification system. Here are the common suffixes used for different taxonomic ranks in zoology:

1. **Domain / Kingdom:** No standard suffix.
2. **Phylum / Division:**
 - Suffix: **-phyla** (animals)
 - Example: **Chordata** (phylum of vertebrates), **Arthropoda** (phylum of insects, arachnids, crustaceans, etc.)
3. **Class:**
 - Suffix: **-ea, -ia, -phyceae, -opsida**
 - Example: **Mammalia** (class of mammals), **Insecta** (class of insects), **Aves** (class of birds)
4. **Order:**
 - Suffix: **-ales**
 - Example: **Carnivora** (order of carnivorous mammals), **Lepidoptera** (order of butterflies and moths)
5. **Family:**
 - Suffix: **-idae** (animals)
 - Example: **Felidae** (family of cats), **Hominidae** (family of great apes and humans)
6. **Subfamily:**
 - Suffix: **-inae**
 - Example: **Felinae** (subfamily of small to medium-sized cats), **Homininae** (subfamily of humans and their close relatives)
7. **Tribe:**
 - Suffix: **-ini**
 - Example: **Pantherini** (tribe of big cats like lions, tigers, leopards), **Hominini** (tribe including humans and their closest extinct relatives)
8. **Genus:**
 - No standard suffix, but the genus name is always capitalized and italicized.
 - Example: **Panthera** (genus of big cats), **Homo** (genus of humans)
9. **Species:**
 - No suffix, but the species name is always in lowercase and italicized, following the genus name.
 - Example: **Panthera leo** (lion), **Homo sapiens** (human)

A species is a group of related individuals that share the same hereditary morphology, exhibit the same physiological characteristics, have a common lifestyle, and occupy a definable geographic area.

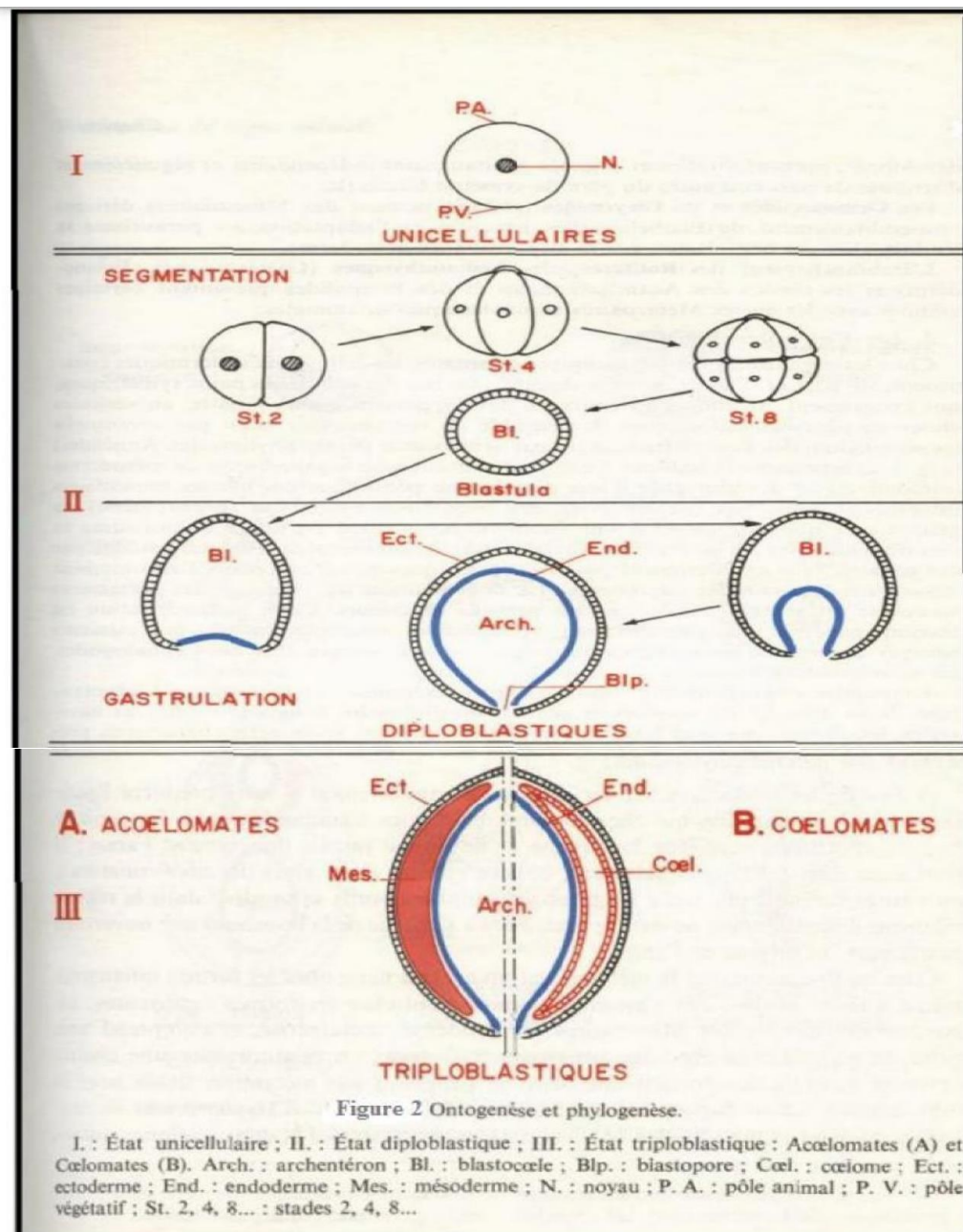
A species is identified by **four** criteria:

1. **Reproductive Criteria:** Internal fertility (intraspecific) and external sterility (interspecific). This means that individuals of the same species can reproduce and produce fertile offspring, while those of different species cannot produce fertile offspring when mated.
2. **Morphological Criteria:** Internal and external morphology.

This refers to the structural features that are characteristic of the species.

3. **Physiological Criteria:** Biochemical (e.g., odors, secretions) and biophysical (e.g., reaction to environmental conditions) attributes. These criteria include physiological traits like metabolism, response to stimuli, and adaptations.
4. **Ecological and Distributional Criteria:** The species' relationship with its environment and its geographical distribution. This includes habitat preference, ecological role, and range of the species in nature

✓ **Embryogenesis and phylogenesis:**



- ✓ **Embryogenesis** is the process of development of an embryo from a fertilized egg (zygote) through various stages until it becomes a fully formed organism. It involves a series of complex and coordinated events that include cell division, cell differentiation, and organ formation
- ✓ **Phylogenesis** : Phylogenesis, also known as phylogeny, refers to the evolutionary history and development of a species or a group of related species. It describes the

ancestral relationships between species and how they have diverged over time due to natural selection, genetic drift, and other evolutionary forces. Phylogenetic studies use morphological data, genetic sequences, and fossil records to construct a "family tree" called a phylogenetic tree or cladogram, which illustrates the evolutionary pathways and common ancestors of various species

