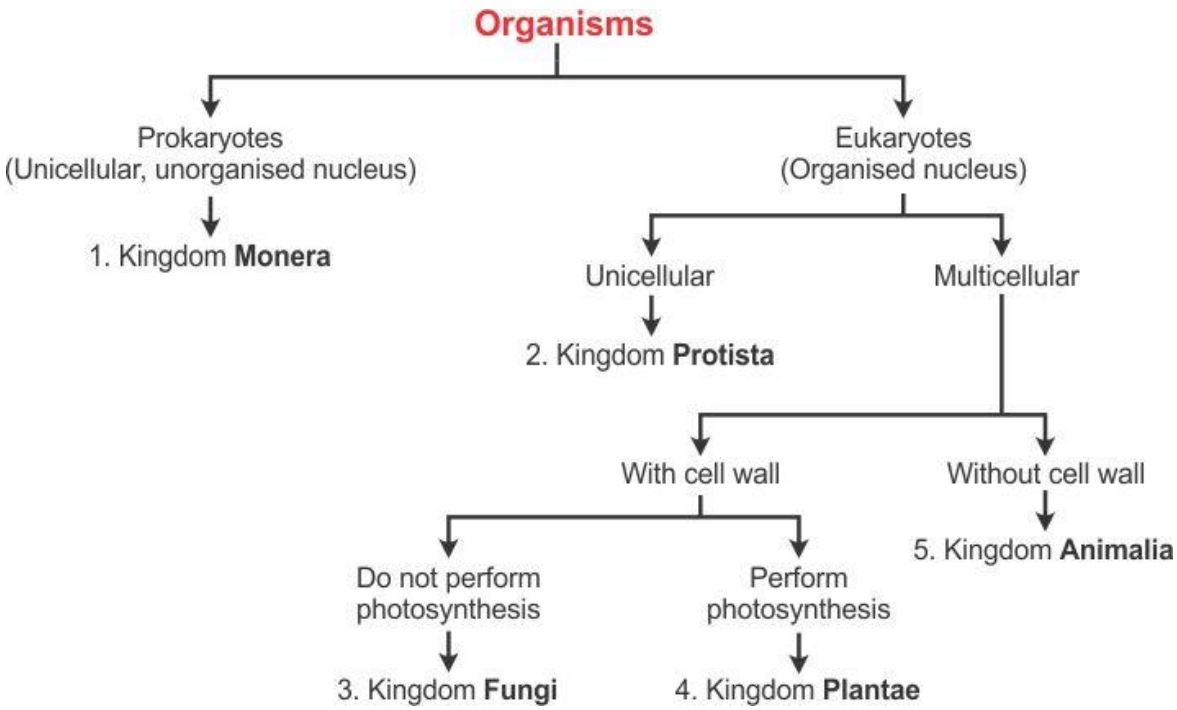
Five Kingdom Classification

- A **species** is an organism of a particular kind whose members can interbreed among themselves to produce fertile young ones.
- Species which are structurally similar or related constitute the next higher category called the **genus**.
- A group of genera with certain common characteristics form a **family**.
- A group of related families constitutes an **order**.
- Orders which share some common characteristics together constitute a **class**.
- A phylum is the largest division in the classification of plants and animals. The classes which share features constitute a **phylum**.
- Related phyla which share some common features form a **kingdom**.
- One of the earliest systems of classification, called the **Two Kingdom Classification**, was proposed by Carolus Linnaeus in 1758.
- According to the two kingdom classification, living organisms were classified into two broad kingdoms—**plants and animals**.
- **Five Kingdom Classification**

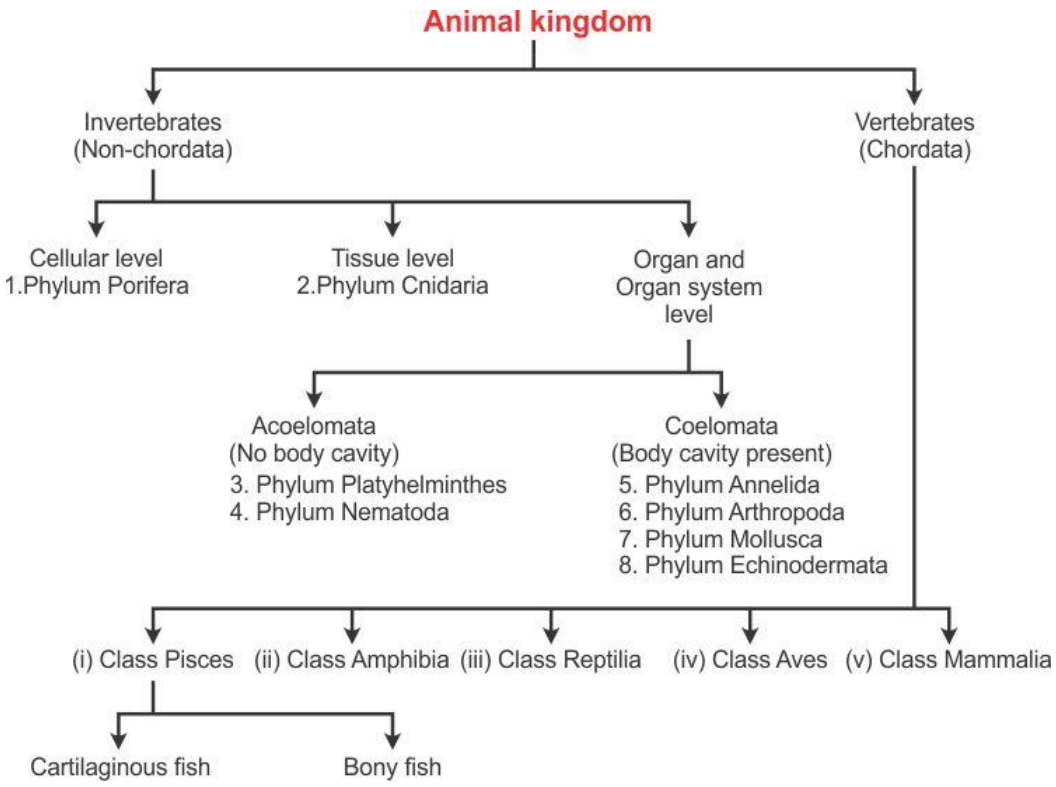


KINGDOM	CHARACTERISTICS	EXAMPLES
Monera	• Organisms have a prokaryotic cell structure. • Cell lacks a distinct nucleus.	Bacteria, Cyanobacteria, Mycoplasma
Protista	• Contain a well-defined nucleus. • Nuclear material organised in the form of a linear, double-stranded and helical DNA along with proteins.	*Chlamydomonas*, *Euglena*, *Amoeba*, *Paramoecium*, *Pandorina*
Fungi	• Possess a true nucleus and a definite cell wall, made of chitin.	*Mucor*, *Rhizopus*, *Puccinia, Ustilago*, *Albugo*, *Penicillium*, *Aspergillus*
Plantae	• Cell is bound by a cell wall which is made of cellulose. • Contains a true nucleus and membrane-bound cell organelles.	Algae, moss, fern, pine, *Hibiscus*
Animalia	• Lack cell wall and plastid.	Earthworm, *Sycon*, beetle, toad

- **Classification of Kingdom Plantae**

DIVISION	CHARACTERISTICS	EXAMPLES
Thallophyta/Algae	• Plants have an irregularly shaped, undifferentiated body called thallus. • Predominantly aquatic.	*Nostoc*, *Oscillatoria*, *Chlamydomonas*
Bryophyta	• Plant body is either in the form of an undifferentiated thallus or in the form of leafy erect structures**.** • No specialised tissue for the conduction of water and other substances from one part of the plant body to another.	*Riccia*, *Funaria*, *Anthoceros*
Pteridophyta	• Plant body is differentiated into stem, leaves and roots. • Have specialised tissue for the conduction of water and other substances from one part of the plant body to another.	*Psilotum*, *Nephrolepis*, *Equisetum*
Gymnospermae	• Bear naked seeds. • Usually perennial, evergreen and woody.	*Gingko*, *Pinus*, *Gnetum*
Angiospermae	• Plant body produces seeds which are enclosed within the fruits**.** • Based on the number of cotyledons, angiosperms are divided into two classes—monocots and dicots.	Maize, bean, wheat

- **Classification of Kingdom Animalia**



- **Differences between Vertebrates and Invertebrates**

FEATURES	VERTEBRATES	INVERTEBRATES
Internal skeleton	Have an internal skeleton.	No internal skeleton.
Backbone	Backbone present.	Backbone absent.
Tail	Tail usually present.	Tail absent (anus at the tip of the back end of the body).
Heart	Heart on the ventral side of the body.	If present, heart on the dorsal side of the body.
Spinal cord	Nerve (spinal) cord dorsal and hollow.	Nerve cord ventral and solid.
Limbs	Have two pairs of limbs.	Have three or more pairs of limbs, if present.
Haemoglobin	Haemoglobin in red blood cells.	Haemoglobin, if present, is dissolved.
Examples	Fish, frog, lizard, bird	Leech, earthworm, *Sycon*

- **Division of Phylum Invertebrate**

PHYLUM	CHARACTERISTICS	EXAMPLES
Porifera	• Simplest multicellular animals with perforated bodies. • The body consists of a hollow tube.	*Sycon*, bath sponge
Coelenterata/ Cnidaria	• Have a two-layered body wall, which encloses a single cavity in which digestion takes place. • There are finger-like projections called tentacles present near the mouth for catching food.	*Hydra*, jellyfish, sea anemone, corals
Platyhelminthes	• Small, soft, flattened, unsegmented worms. • Do not have a body cavity or coelom.	Liver fluke, tapeworm, *Planaria*
Annelida	• The body is cylindrical and divided into ring-like segments. • Have a true body cavity called coelom, present between the body wall and the digestive tube, which is filled with coelomic fluid.	Earthworm, leech, *Nereis*
Nematoda/ Nemathelminths	• The body is long, cylindrical and unsegmented without a body cavity. • The nervous system is well-developed and consists of simple nerves.	Hookworm, *Ascaris*
Arthropoda	• Have jointed limbs, one pair each on some or on all body segments. • Have an exoskeleton made of chitin. • Lack cilia.	Crayfish, crab, millipede, centipede, insects, scorpion, spider
Mollusca	• Have a soft, unsegmented body without appendages, with a hard, calcareous shell to protect the soft body.	Snail, slug, oyster, mussel, clam, squid, octopus
Echinodermata	• The body may be spherical, cylindrical or star-shaped, hard, unsegmented or non-metameric. • Possess a spiny exoskeleton.	Starfish, brittle star, sea urchin, sea cucumber

- **Division of Phylum Vertebrata**

PHYLUM	CHARACTERISTICS	EXAMPLES
Pisces	• Organisms belonging to Class Pisces are fish. • They are cold-blooded or poikilothermic animals.	Cartilaginous fish: Shark, dogfish, skate Bony fish: Carp, roach, herring, trout
Amphibia	• The body is divisible into head and trunk. Neck is absent. • Have a three-chambered heart with two auricles and one ventricle. • Cold-blooded vertebrate animals.	Frog, toad, salamander, newt
Reptilia	• The body is divisible into head, neck, abdomen and tail. • Most of them have a three-chambered heart. Ventricle of the heart is partially divided.	Lizard, snake, tortoise, turtle, crocodile, alligator
Aves	• All birds belong to Class Aves. • Warm-blooded or homeothermic animals. • Heart is four-chambered.	Pigeon, sparrow, crow, duck, owl, penguin, ostrich, emu
Mammalia	• Warm-blooded animals. • Have a four-chambered heart with two auricles and two ventricles.	Cat, dog, cow, sheep, rat, bat, seal, monkey, apes, man

- The **binomial nomenclature** system was suggested by the Swedish botanist **Carolus Linnaeus**.

- According to the binomial nomenclature, every organism is given a scientific name for individual identity. The scientific name includes two terms. The **first term** is the name of the **genus** and the **second term** is the name of the **species**.