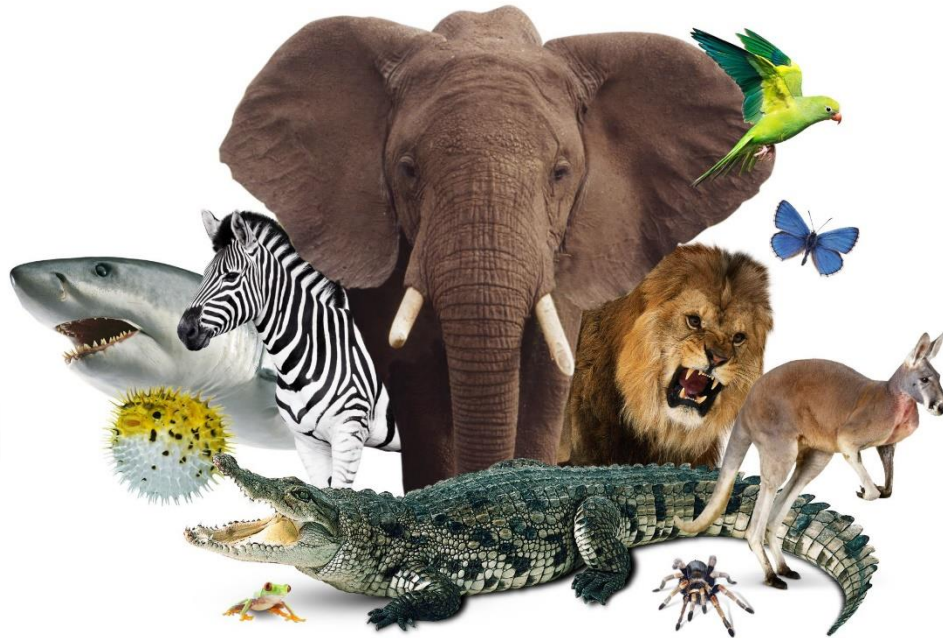


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Animal Kingdom



Animals are eukaryotic, multicellular, species belonging to the Kingdom Animalia. Every animal has its own unique characteristics. They obtain their energy either by feeding on plants or on other animals. There are millions of species which have been identified, few share similar characteristics while others differ drastically.

Classification of Animal Kingdom

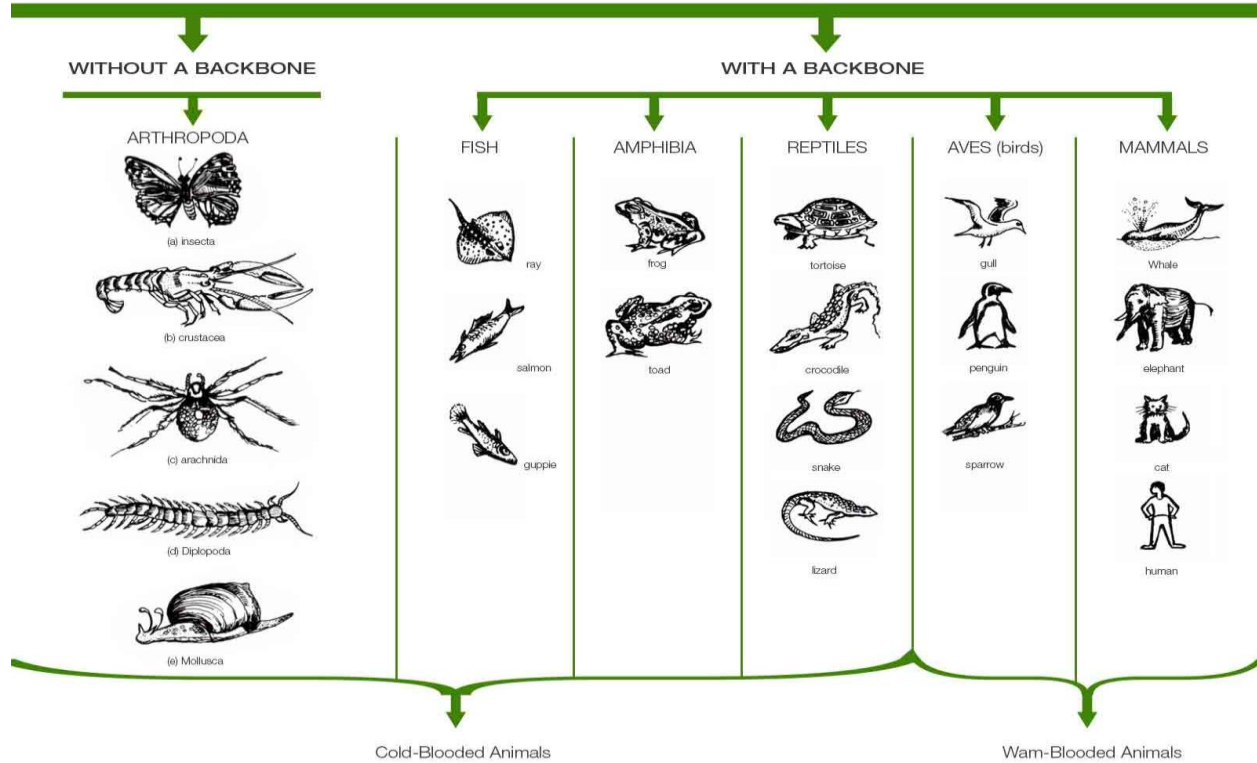


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Classification of Animal Kingdom



Animals are classified based on their characteristics. They are eminent from [algae](#), plants, and fungus where rigid cell walls are absent. Some are also heterotrophic, in general, they digest their food within the internal chambers which again distinguish them from algae and plants. Another elite character of these species is that they are motile, except in certain life stages.

Protozoa

Protozoa are the different group of eukaryotic organisms which are unicellular having some similar characteristics of animals such as motility and predation. Protozoa take in food by the process of osmotrophy that is by engrossing the [nutrients](#) through the cell membranes or also they feed on phagocytosis, either by the process of engulfing the particles of the food with the help of pseudopodia.

Bryozoans



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Bryozoans are normally acknowledged as moss animals. They are filter feeders which sift food particles out of the water using a crown of tentacles lined with cilia and most of them dwell in humid waters, few in glacial waters and some in marine trenches. Most of them are colonial and one genre is solitary. Zooids are individuals in bryozoans and they are not completely independent species. All colonies have auto zooids, which are accountable for feeding and excretion.



Vertebrates

Vertebrates are the animals possessing backbones. Some include jawed vertebrates and jawless fish. For example sharks, ray fish, and bony fish. A bony fish named clad also further falls into the class of amphibians, reptiles, mammals, and birds. Extant vertebrates vary in size beginning from the frog species named Paedophryne amanuensis to the blue whale. Amphibians are species that live in the land and move to water for breeding. Reptiles are covered by scutes. Mammals are terrestrial, aquatic or aerial. Birds are covered with feathers and have streamlined avenues.



1. **Organ Level of Organization:** Animal tissues comprising of similar capacity are classified into shaped organs. Every organ is definite for particular capacity. For example Platyhelminthes.
2. **Tissue Level of Organization:** Animal cells displaying division of exercises among themselves. Cells performing the same function cooperate to form tissues.
3. **Organ framework Level of Organization:** The organ framework level of organization are displayed in those organisms where organs define the shape of functional frameworks and each framework is with a distinct physiological capacity.
4. **Cellular Level of Organization:** This organization consists of animals with cells which are formed as free cell lumps.

Organ Systems Patterns

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Circulatory System: They are 2 types of the Circulatory framework – open type and closed type.

- **Open Type:** In this type of circulatory system the blood is pumped out of the heart. For example Mollusca and Arthropods.
- **Closed Type:** In this type of circulatory system the blood flows through a progression of vessels that is capillaries, arteries, and veins.

Digestive System: There are 2 types of digestive system. Complete and Incomplete digestive systems.

- **Complete Digestive System:** In this type of digestive system there are 2 openings to the outside of the body, a rear-end and a mouth. For instance: Chordates and Arthropods.
- **Incomplete Digestive System:** It consists of only one open to the outside of the body a solitary opening which serves as both rear-end and mouth. For example Platyhelminthes.

Body Symmetry: There are 3 types of symmetry. Bilateral, Radial, and Asymmetrical.

1. **Bilateral Symmetry:** Animals, where a body can be partitioned into indistinguishable left and right parts, are known to be bilaterally symmetrical.
2. **Radial Symmetry:** Animals tend to display spiral symmetry. For example Coelenterates, Echinoderms, and Ctenophores.
3. **Asymmetrical:** Asymmetry is the finished nonappearance of symmetry. That is a few animals cannot be divided into two equivalent parts along with any plane going through the focal point of the organism. For example Sponges.

Five Kingdom Classification

The five-kingdom classification that we see today was not the initial result of the classification of living organisms. Carolus Linnaeus first came up with a two-kingdom classification which included only kingdom Plantae and kingdom Animalia.

The two-kingdom classification lasted for a very long time but did not last forever because it did not take into account many major parameters while classifying. There was no differentiation of the eukaryotes and prokaryotes; neither unicellular and multicellular; nor photosynthetic and the non-photosynthetic.

Putting all the organisms in either plant or animal kingdom was insufficient because there were a lot of organisms which could not be classified as either plants or animals.

All these confusions led to a new mode of classification which had to take into account cell structure, the presence of cell wall, mode of reproduction and mode of nutrition. As a result, R H Whittaker came up with the concept of the five-kingdom classification.

All living organisms are classified into five kingdoms:

- Monera

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- Protista
- Fungi
- Plantae
- Animalia

In this section, let discuss in brief about kingdom Animalia, Plantae, and Viruses.

Kingdom Monera

Kingdom Monera is considered as the most primitive group of organisms and monerans are most abundant of all. It generally comprises unicellular organisms with a prokaryotic cell organization. They lack well-defined cell structures including the nucleus and other cell organelles.

They consist of prokaryotes which include species like the Cyanobacteria, archaebacteria, mycoplasma, and bacteria are a few members of this kingdom.

The general features of Monerans are:

1. Monerans are present in both aerobic and anaerobic environment.
2. Some have rigid cell walls, while some do not.
3. The membrane-bound nucleus is absent in monerans.
4. Habitat – Monerans are found everywhere in hot or thermal springs, in the deep ocean floor, under ice, in deserts and also inside the body of plants and animals.
5. They can be autotrophic, i.e., they can synthesize food on their own while some others have a heterotrophic, saprophytic, parasitic, symbiotic, commensalistic and mutualistic modes of nutrition.
6. Locomotion is with the help of flagella.
7. Circulation is through diffusion.
8. Respiration in these organisms vary, few are obligate aerobes, while some are obligate anaerobes and facultative anaerobes
9. Reproduction is mostly asexual and few also reproduce by sexual reproduction. Sexual reproduction is by conjugation, transformation, and transduction. Asexual reproduction is by binary fission.



Fig.: Kingdom_Monera

Kingdom Protista

All unicellular eukaryotic organisms are placed under the Kingdom Protista.

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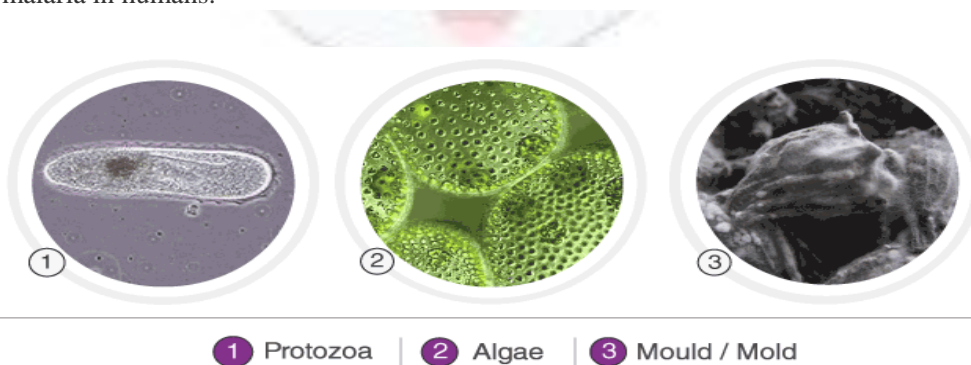
The term Protista was first used by Ernst Haeckel in the year 1886. This kingdom forms a link between other kingdoms of fungi, plants, and animals.

Kingdom Protista is an important phase in early evolution and the very first *protist* probably evolved 1.7 billion years ago.

Kingdom Protista is a very large group comprising of at least 16 phyla. Many species of this kingdom are the primary producers in the aquatic ecosystem and some are responsible for serious human diseases like malaria.

General features of Kingdom Protista are as follows:

1. They are simple, unicellular, eukaryotic organisms.
2. Most of the protists live in water, some in moist soil or even the body of human and plants.
3. These organisms have a membrane-bound nucleus, endomembrane systems, mitochondria for cellular respiration and some have chloroplasts for photosynthesis.
4. Nuclei contain multiple DNA strands and the number of nucleotides is significantly less.
5. Respiration – cellular respiration is the primarily aerobic process, but some living in the moist soil underneath ponds or in digestive tracts of animals are facultative anaerobes.
6. Locomotion is often by flagella or cilia.
7. Nutrition- include both heterotrophic and autotrophic.
8. Reproduction – Some reproduce sexually and others asexually.
9. Some protists are pathogens of both plants and animals. Example: Plasmodium falciparum causes malaria in humans.



1 Protozoa | 2 Algae | 3 Mould / Mold

Fig.: Kingdom Protista

Kingdom Fungi

Fungi are a group of organisms that are found everywhere from air, water, land to the soil. They are also found in plants and animals.

Some fungi are microscopic and others are gargantuan – almost extending over a thousand acres. And even though fungi appear like plants, they are in fact closely related to animals.

Fungi have great economic importance and show a great diversity in morphology and habitat. More than 70,000 species of fungi have been recognized and the organisms of kingdom fungi include mushrooms, smuts, yeasts, puffballs, rusts, smuts, truffles, morels, and moulds.

General features of fungi are as follows:

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1. Fungi are eukaryotic, non-vascular and non-motile organisms.
2. The growth rate of fungi is slower than that of bacteria.
3. Fungi grow best in an acidic environment.
4. The Kingdom Fungi consist of both unicellular (e.g. Yeast, Molds) and multicellular (e.g. mushrooms) organisms.
5. Like plant cells, fungi have cell walls made up of complex sugar molecules called chitin. But unlike plants, they do not undergo [photosynthesis](#).
6. The cell wall is composed of chitin. The vegetative body of the fungi may be unicellular or composed of microscopic threads called hyphae.
7. They have a heterotrophic mode of nutrition. Few species are saprophytes i.e., they feed on dead and decaying organic matters.
8. Some fungi are parasitic while some are symbionts. They can live in a symbiotic relationship with algae, like blue-green algae. These are called lichens.
9. Reproduction in fungi is both by sexual and asexual means. Asexual reproduction takes place by means of spores and sexual reproduction takes place by means of gametic copulation, somatic copulation, and Spermatization.



Fig.: [Kingdom Fungi](#)

Kingdom Monera, Protista and Fungi- Comparison Chart

The difference between kingdom Protista, monera and fungi are as follows:

Kingdom Monera	Kingdom Protista	Kingdom Fungi
Unicellular Prokaryotes	Unicellular Eukaryotes.	Unicellular or Multicellular eukaryotes
No cellular organelles	Membrane-bound cell organelles	Cell organelles are present
Simple structure	Complex structure	Complex cellular organization
Cell wall is present but not well developed.	Well-developed cell wall is present.	Cell wall is made up of chitin

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No true nucleus	Has a true nucleus	Possess a true nucleus
Autotrophic or heterotrophic mode of nutrition	Holozoic, parasitic or photosynthetic mode of nutrition.	Heterotrophic or saprophytic mode of nutrition.
Flagella and cilia absent	Flagella and cilia present	Flagella are present for locomotion
Reproduction is asexual	Reproduction is sexual or asexual	Reproduction is sexual and asexual
Found everywhere	Found in aquatic, moist and shady places.	Found mostly in an acidic environment
Example: Mycobacterium, Bacillus,	Example: Dinoflagellates, protozoan, slime moulds	Example: yeast, mushrooms

Kingdom Animalia

- Kingdom Animalia includes all the multicellular, eukaryotic, heterotrophic organisms.
- These animals cannot prepare their own food and hence depend on other organisms for nourishment.
- The organisms belonging to **kingdom Animalia** lack cell walls.
- About 800,000 different species and 36 separate phyla have been identified under kingdom Animalia.
- They exhibit all the levels of organization in structure i.e. they range from primitive organization to the organ system level of organization
- They reproduce sexually as well as asexually.
- They also have the ability to regrow the missing parts. This process is known as regeneration.
- Few animals ingest their food and digest it in an internal cavity.
- Most animals possess the ability to move from one place to another. These are known as motile animals. The animals that cannot move are known as sessile.

Kingdom Plantae

- Kingdom Plantae includes all the eukaryotic, multicellular plants, that perform photosynthesis to prepare their food.
- Plants have rigid cell walls made of cellulose and pectin.
- They possess organelles like chloroplast and chlorophyll that facilitate photosynthesis.
- These are non-motile.
- They can reproduce sexually as well as asexually.
- Few plants such as pitcher plant cannot prepare their own food and feed on insects to derive nutrition.

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- They are beneficial to maintain ecological balance. A reduction in the number of plants has resulted in global warming.
- The members of **kingdom Plantae** have a unique life cycle which follows alternation of generation between two phases – diploid sporophytic phase and haploid gametophytic phase.

Viruses

- Viruses are microscopic organisms that are known to be the connecting link between living and non-living.
- These were not placed under the five-kingdom classification since they are neither living nor dead. Hence, they form their own group.
- Viruses are devoid of cells and cell organelles. Therefore, they depend upon the machinery of the host cell to replicate and synthesize proteins.
- Viruses are usually smaller than bacteria in size. The first virus to be discovered was the Tobacco mosaic virus (TMV) that infects the tobacco plant.
- Viruses basically consist of genetic material i.e. nucleic acid (DNA or RNA) surrounded by a protein capsule.

