

PROKARYOTES AND PROTISTS

The science of classifying organisms is called **Taxonomy**.

Organisms are classified in different categories, on the basis of the degree of similarity and the degree of their evolutionary history.

As described in Figure 1. There are eight major taxonomic categories.

Domain, Kingdom, Phylum, Class, Order, Family, Genus, Species.

To remember the categories you may want to use this mnemonic phrase-

Dumb King Philip Came Over For Graduate School.

There are 3 Domains. Archaea, Bacteria and Eukarya.

The **prokaryotes** are divided into **Domains Archaea** and **Bacteria**. They are **unicellular**. They lack nucleus.

Bacteria reproduce asexually by binary fission. They exchange their genetic material through a process called conjugation. Bacteria show three characteristic shapes. Rod shaped bacteria are called- **bacillus**. Spherical shaped are known as- **coccus** and spiral shaped are **spirillum**. Bacteria have several modes of nutrition. Most bacteria are heterotrophs. Some are autotrophs. Autotrophs are chemosynthetic or photosynthetic. *Anabena* and *Oscillatoria* are the examples of photosynthetic bacteria called **cyanobacteria**. Bacterial cell wall is made of peptidoglycan.

Eukaryotes contain nucleus. Eukaryotes are classified under **Domain Eukarya**. Which is further grouped in kingdoms.

There are major four Kingdoms in **Domain Eukarya**:

Kingdom Protista

Kingdom Plantae

Kingdom Fungi

Kingdom Animalia.

The scientific name of the organism consists of the last two categories, Genus and Species. The scientific name for humans is Homo (Genus) sapiens (species). It is correctly written as Homo sapiens or *Homo sapiens*. Notice that the first letter of only Genus name is capitalized. It is written in italics or underlined when hand written.

Kingdom Protista Protists are eukaryotic and unicellular

Animal like protists: Protozoans. Protozoans lack a cell wall.

Classified further in phyla on the basis of Locomotion.

Phylum

Phylum

Phylum

Phylum

Sarcodina

Ciliophora

Zoomastigophora

sporozoa

Move using pseudopodia
(Extensions of the cell)

use cilia-hairlike
structures

move with flagella

no motility

e.g. *Amoeba*

e.g. *Paramecium*

e.g. *Trichonympha*

e.g. *Plasmodium*

foraminiferans &

collaris lives in termite

vivax causes

radiolarians have shells

gut. *Trypanosoma brucei*

malaria

causes African sleeping

sickness

In *Paramecium*, asexual reproduction is called binary fission. In the process of conjugation exchange of micronuclear material takes place between the paired organisms.

Plantlike protists- All have chloroplasts and most of them have cell wall.

Phylum Dinoflagellata
Cell wall- mostly cellulose
presence of two flagella
e.g. *Ceratium*

Phylum Bacillariophyta
cell wall- Silica
Diatoms

Phylum Euglenophyta
cell wall absent
plantlike & animal like
e.g. *Euglena*

Fungi like protists: Slime molds

Phylum Acrasiomycota
Cellular slime molds
e.g. *Dictyostelium*

Phylum Myxomycota
Plasmodial slime molds
e.g. *Physarum*

Prepare a chart which includes these basic criteria for classification of organisms in different kingdoms and domain bacteria.

kingdom /domain	cellular complexity	mode of nutrition	mode of reproduction	cellwall composition
	unicellular/ multicellular	autotroph/ heterotroph	sexual/asexual	

List of Assignments

This list is not final. This is to be used only as a reference.

Domain Bacteria

Assignment-2

- Prepared slide of bacterial shapes. For pictures see page 89
- Prepared slide of cyanobacteria-: *Anabena* (instead of *Gleocapsa*)
- Prepared slide of cyanobacteria - *Oscillatoria*.

Kingdom Protista (Domain Eukarya)

Assignment-3 (animal-like protists) For pictures see page 91, 92.

- Prepared slide of *Trypanosoma brucei*
- Prepared slide of *Trichonympha* (flagellates from the termite gut)
- Prepared slide of *Amoeba*
- Prepared slides of radiolaria and foraminifera shells.
- Make wet mount slide of *Paramecium*.
- Prepared slide of *Paramecium*.
- Prepared slide of *Plasmodium vivax*

Assignment-4 (plant-like protists) For pictures see page 93.

- Make a wet mount slide of *Euglena*
- Prepared slide of Dinoflagellate (*Ceratium*).
- Prepared slide of Diatoms
- Diatomaceous earth

Assignment-6 (reproduction in protists)

- Prepared slide of *Paramecium* undergoing binary fission – asexual reproduction
- Prepared slide of *Paramecium* undergoing conjugation

Assignment-7

- Prepare wet mount slides of hay, herb and pepper infusions.

