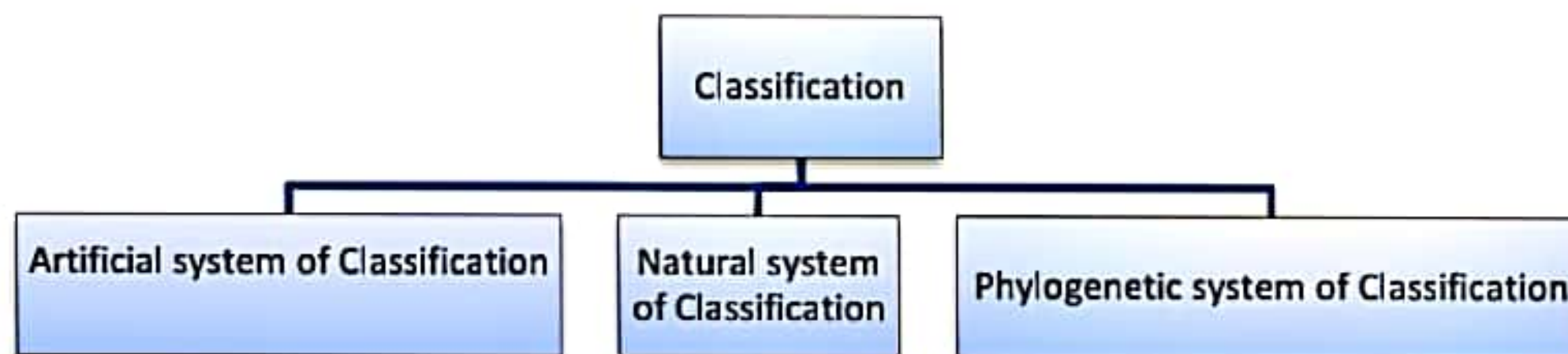


Biological classification is the scientific procedure of arranging organisms into groups and subgroups on the basis of their similarities and dissimilarities and placing the group in a hierarchy of categories.

Importance of classification-

- It is not possible to study every organism. Study of one or two organism of a group gives sufficient information about the essential features of the group.
- It helps in identification of new organism.
- Classification helps in knowing the relationship amongst different groups of organisms.
- The organism of past cannot be studied without a proper system of classification.

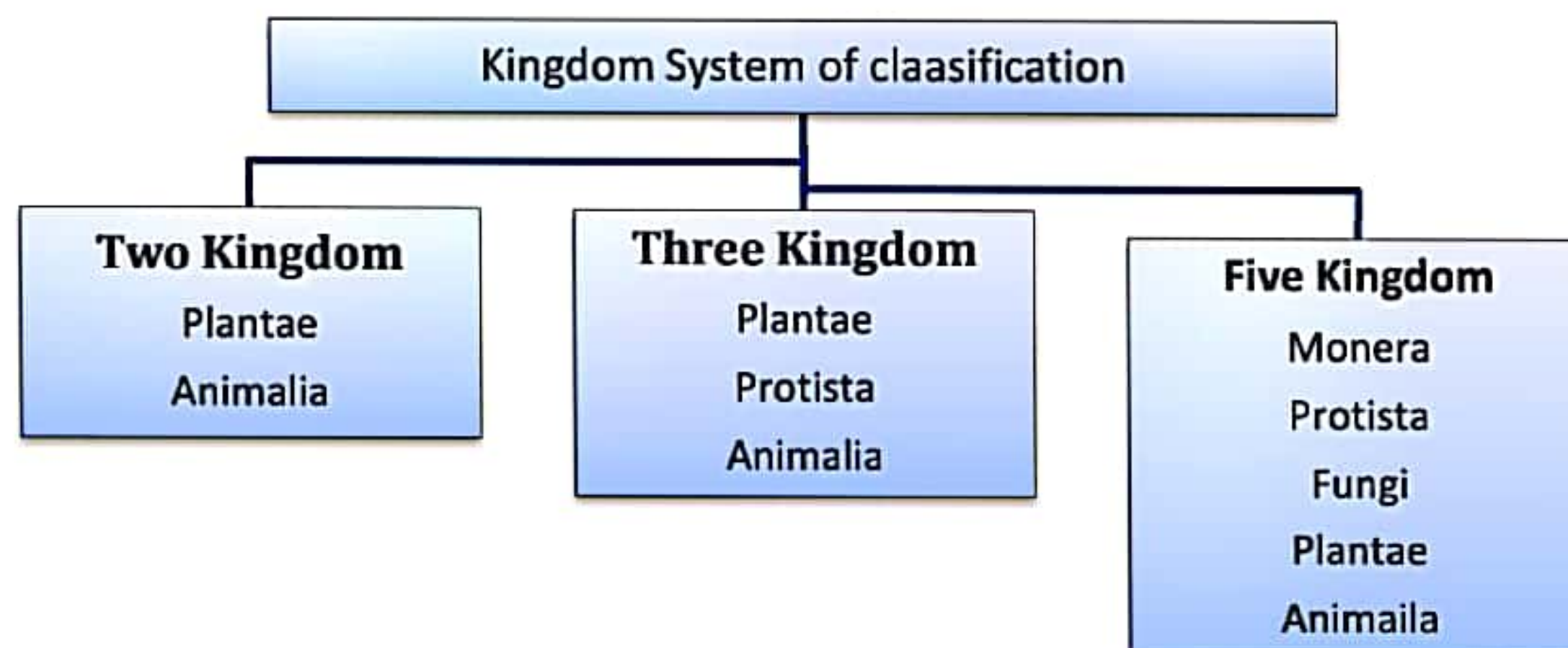


Artificial system of classification- One or two morphological characters for grouping of organism is used only. Flowering and non-flowering plants, enaima and anaima. Aristotle classification.

Natural system of classification- Takes into consideration comparable study of a number of characters so as to bring out natural similarities and dissimilarities and hence natural relationships among the organisms. Bentham and Hooker classification etc.

Phylogenetic System of Classification- Based on the evolutionary relationship of organisms. In this system organism are classified on the basis of their evolution on earth from primitive to highly evolved. Engler and Prantl classification and Hutchinson classification etc.

Depending upon the type of system of classification organism are classified into following kingdom system.



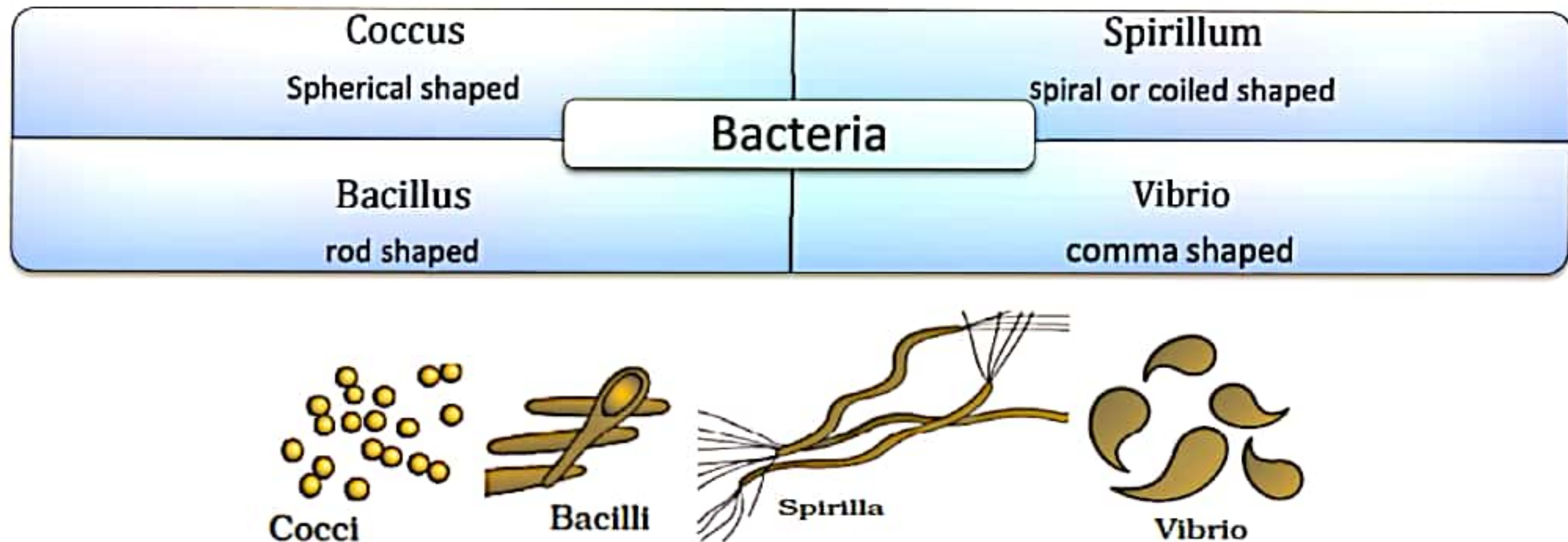
- In kingdom two system of classification organisms are grouped on the basis of presence and absence of cell wall as proposed by Linnaeus(father of taxonomy).
- Three kingdom systems- Haeckel separated unicellular animals, algae and fungi on the basis of lack of tissue differentiation and new kingdom Protista was introduced.
- Five kingdom systems- R.H.Whittaker divided all the organism into five kingdom in order to develop phylogenetic classification.

1. **Monera**- The kingdom includes all prokaryotes- mycoplasma, bacteria, actinomycetes and cyanobacteria.

- (a) Unicellular, prokaryotes and contain the most primitive of living forms
- (b) The cells are microscopic and cell wall is generally present.
- (c) Genetic materials are not organized into nucleus and contain naked DNA.
- (d) Membrane bounded organelles are absent.
- (e) Reproduction is asexual except gene recombination.
- (f) Flagella may be present and are of single stranded.

Example- Blue-green algae, Bacteria etc.

Bacteria are the most abundant micro-organism that can survive in all kinds of climate.

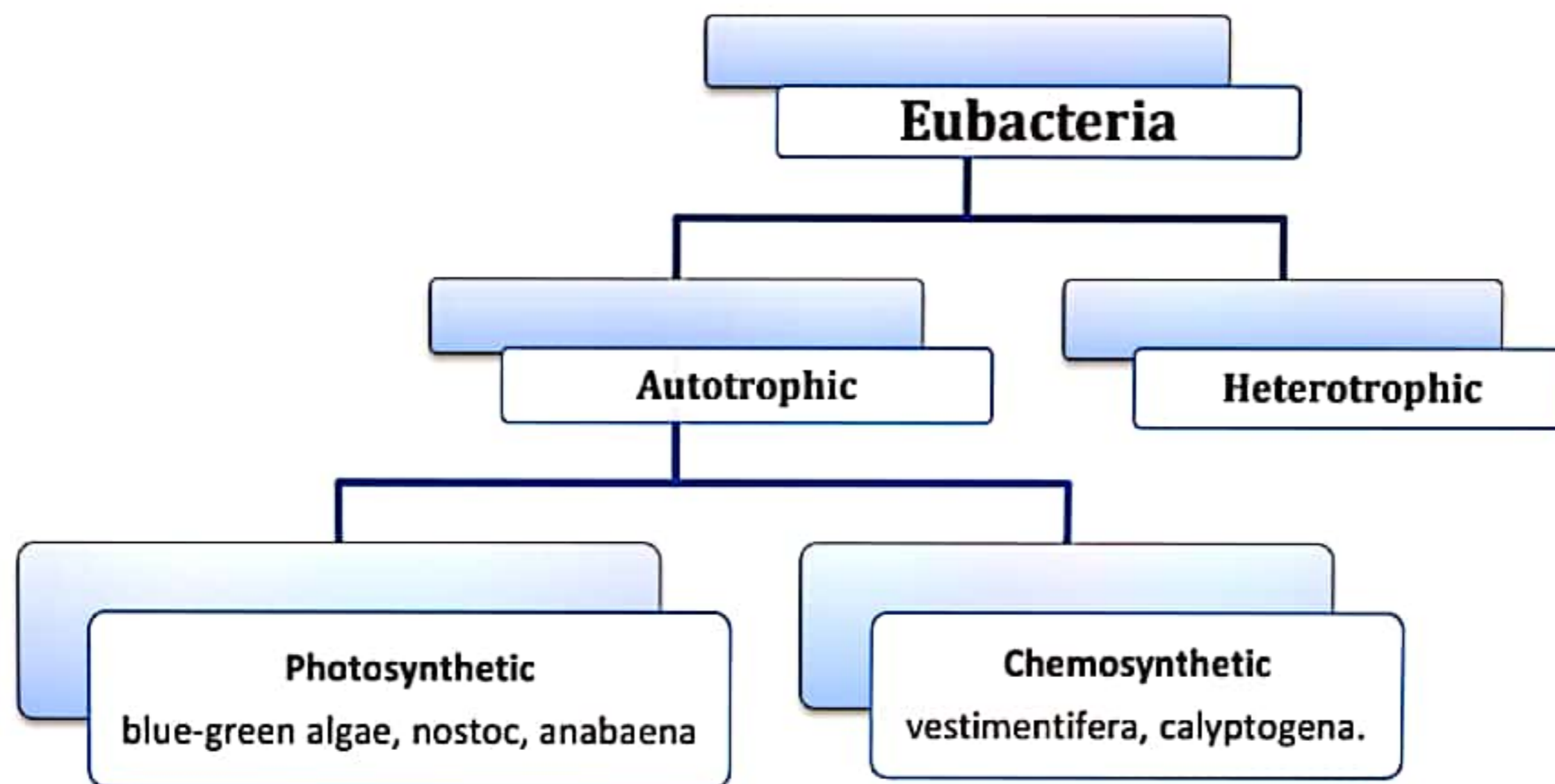


Archaeobacteria – They are group of most primitive prokaryotes which live under most hostile conditions like extreme salty area (halophiles), hot springs (thermoacidophiles) and marshy area (methanogens). They differ from other bacteria in having different cell wall structure (absence of peptidoglycan). Methanogens are present in the gut of several ruminant animals like cows and buffalo, which is responsible for production of biogas (methane) from dung of these animals.

Eubacteria – They are called as true bacteria contain rigid cell wall, if motile contain flagellum. Cyanobacteria or blue-green algae are gram positive photosynthetic bacteria. They contain chlorophyll a and carotenoids. They may be unicellular, colonial or filamentous, fresh water, marine or terrestrial. Some of them have specialized heterocyst cells to perform nitrogen fixation (Nostoc and Anabaena).

Chemosynthetic bacteria oxidize inorganic substances like nitrate, nitrite, ammonia etc. to produce energy and help in recycling of nitrogen, phosphorous, sulphur etc.

Heterotrophic bacteria are most abundant and act as decomposer. They are helpful in production of curd, antibiotic and fixing nitrogen in leguminous plants. Some of them are pathogenic and cause disease like cholera, typhoid, tetanus and citrus canker.



Mycoplasma – they are the simplest free living prokaryotes. They are also known as PPLO (Pleuropneumonia like organism). They lack cellwall and can survive without oxygen. They cause disease in plants and animals.

2. **Protista**- Kingdom Protista includes Chrysophytes, Dinoflagellates, Eugleoids, slime mould and Protozoans.

- (a) It includes all unicellular and colonial eukaryotes.
- (b) Most of them are aquatic forming plankton.
- (c) Mode of nutrition may be photosynthetic, saprobic, parasitic or holozoic.
- (d) Flagella if present are 11 stranded with 9+2 arrangement of microtubules composed of tubulin.
- (e) Genetic material consists of 2 or more DNA molecules.

Chrysophytes

- They includes diatoms and golden algae (desmids) found in fresh water as well as marine water.
- In diatoms cell wall forms two thin overlapping cells which fit together as in soap box.
- The siliceous indestructible cell wall pile up at the bottom of water reservoirs and form big heaps called **diatomaceous earth**. It may extend for hundred meter and used for polishing, filtration of oil and syrups. They are chief producer in oceans.

Dinoflagellates

- They are basically unicellular motile, biflagellate and photosynthetic protists.
- Predominate colour is golden brown but yellow, green, red and even blue.
- Some Dinoflagellates like *Gymnodinium* and *Gonyaulax* grow in large number in the sea and make the water look red and cause the so called “**red tide**”.

Eugleoids

- They are Euglena like unicellular flagellates which possess pellicle instead of cell wall which make their body flexible.
- They have two flagella, one short and other long.
- They are photosynthetic in presence of sunlight and act as predators in absence of sunlight.
- Example- *Euglena*, *Peranema*.

Slime Moulds

- They are saprophytic protists and feeds on decaying twinges and leaves.
- Under favorable condition, they form an aggregation called plasmodium which produce fruiting bodies bearing spores.
- The cell wall of spores bears cellulose.
- Example- *Physarum*, *Fuligo*.

Protozoans

- All protozoans are heterotrophs and live as predators of parasites.
- They are considered as primitive relatives of animals.
- Amoeboids move and capture food by pseudopodia. Some are parasitic also.
- Flagellated protozoans are free-living or parasitic. They have flagella.
- Ciliated protozoans are aquatic and have cilia all over the body for movement.
- Sporozoans includes organism that have infectious spore like stage in their life cycle.

