

FIVE KINGDOM CLASSIFICATION

Whittaker has used five criteria for delimiting the different kingdoms:

Complexity of cell structure, prokaryotic and eukaryotic

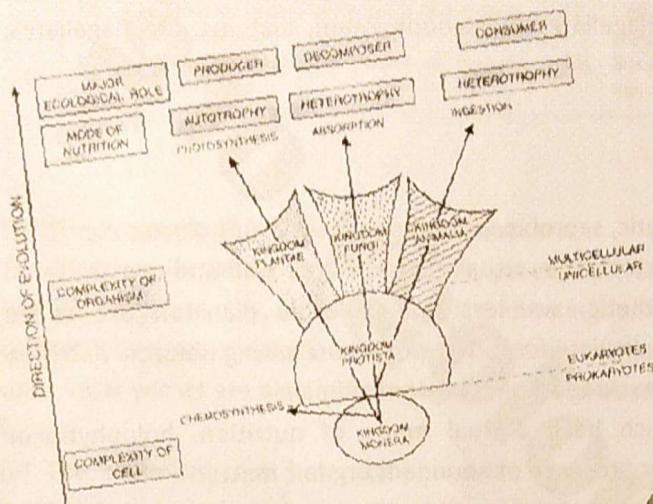
(ii) Complexity of body structure or structural organisation, unicellular and multicellular.

(iii) Mode of nutrition which is divergent in multicellular kingdoms— photo-autotrophy in plantae, absorptive heterotrophy in fungi and ingestive heterotrophy in animalia. Photoautotrophic nutrition is also called holophytic nutrition while absorptive heterotrophy is known as holozoic nutrition. Absorptive heterotrophy is saprobiotic (= saprophytic) nutrition.

(iv) Ecological life style like producers (plantae), decomposers (fungi) and consumers (animalia).

(v) Phylogenetic relationships

Whittaker's five kingdoms are Monera, Protista, Plantae, Fungi and Animalia



Monera— Kingdom of Prokaryotes:

The kingdom includes all prokaryotes— mycoplasma, bacteria, actinomycetes and cyanobacteria or blue green alge. Along with fungi, they are decomposers and mineralizers of the biosphere.

(i) Monerans are basically unicellular (monos-single) prokaryotes and contain the most primitive of living forms,

(ii) They are varied in their nutrition— saprobic, parasitic, chemoautotrophic, photoautotrophic and symbiotic.

The photoautotrophs include both aerobes and anaerobes,

(iii) The cells are microscopic (0.1 to a few microns in length),

(iv) Cell wall is generally present. It contains peptidoglycan and polysaccharides Other than Cellulose,

(v) Cells have one envelope type of organisation, i.e., the whole protoplast is covered by plasma membrane but internal compartmentalization is absent,

(vi) Genetic material is not organised into a nucleus,

(vii) DNA is naked, i.e., it is not associated with histone proteins. DNA lies coiled inside the cytoplasm. The coiled mass is known as nucleoid. It is equivalent to a single chromosome,

(viii) All membrane bound cell organelles are absent, e.g., mitochondria, lysosomes, sphaerosomes, Golgi bodies, plastids, etc.

(ix) The flagella, if present, are single stranded instead of being 11 stranded in eukaryotes. They are formed of protein called flagellin.

(x) Mitotic spindle is absent,

(xi) Gametes are absent. Gene recombination has been discovered in certain cases. Otherwise reproduction is by asexual methods,