Diversity In Living Organism

- literal meaning of diversity is variety.
- Bio-diversity means diversity of life forms that is variety of life forms found in a particular region.

On Earth different variety of life form exists, we canint look at them one by one so we prefer to classify them based on different characteristics.

• What the basis of classification?

- Several basis for classification like:-
  a.) cell design or cell structure :- i) Eukaryotic ii) Prokaryotic
  b.) No. of cell :- i) Single cell ii) Multicellular.
  c.) Do organism produce own food or depend on other for food.

• Hierarchy of classification

- Robert Whittaker, on basis of cell structure tried to classified living into broad categories called kingdom.
- These kingdoms further divided on basis of cell structure, mode and source of Nutrition and body organisation.

Kingdom → Monera, Protista, Fungi, Plantae, Animalia

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Phylum (for animal) / Division (for plants)

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Class

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Order

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Family

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Genus

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Species

- 5 kingdoms proposed by whittaker, are classified on basis of

a.) Cell structure whether → Unicellular / Multicellular
→ Prokaryotic / Eukaryotic

b.) Mode and source of Nutrition that is → Hetrotrophic
→ Autotrophic
→ Saprobhyte

c.) body organisation

i) Monera :- • Prokaryotic • Unicellular • Some have cell wall while some do not • Either Autotrophic / Hetrotrophic
Example :- bacteria, blue-green algae or cyanobacteria

ii) Protista :- • Unicellular • Eukaryotic • Have hair like structure cillia • Either Autotrophic / Hetrotrophic
Example :- algae, protozoan

iii) Fungi :- • Hetrotrophic • Eukaryotic • some are Saprophyte (feed on decayed matter) • Mostly multicellular • Some have Symbiotic Relationship (i.e mutually dependent) like lichen
Example :- yeast, Mold, Mushroom.
lichen are symbiosis of Algae & blue-green algae

iv) Plantae :- • multicellular • Eukaryotic • with cell wall • Autotrophic (use chlorophyll for photosynthesis)

v) Animalia :- • multicellular • Eukaryotic (without cell wall) • Hetrotrophic

Plantae

- Among 5 kingdom, Plantae is further classified on basis of :-

a.) whether Plant body have well differentiated, distinct part.
b.) " " " " special tissue for transportation of water and other substance
c.) Ability to bear seeds.
d.) Seeds are enclosed within fruits.

~~Moreover~~

1.) Thallophyta :- • Don't have well-differentiated body
• Plant in this group are commonly called algae
Example :- Spirogyra, Ulothrix

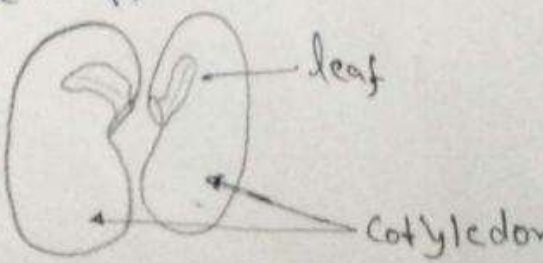
2.) Bryophyta :- • Differentiated to form stem and leaf • No specialised tissues for conduction of water and other substances
Example :- most

3.) Pteridophyta :- • Differentiated into roots, stem and leaves
• Specialised tissue for conduction of water and other substance
Example :- fern, Marsilea • They are ~~cryptogam~~ cryptogam
i.e those with hidden reproductive organ

Some plants with well-differentiated reproductive and ultimately make seeds are called phanerogams. They further classified based on whether seeds are naked or enclosed in fruit. that is gymnosperm and Angiosperm.

4.) Gymnosperm :- • Naked seed Example - Pine and deodar

5.) Angiosperm :- • covered seed • They are called flowering plants • Seed develop inside ovary which modified to become a fruit • Inside seed, there present cotyledon (these are seed leaves) • On basis of no of cotyledon seed are further classified into mono-cot (single leaf) and Dicot (double leaf)



Animalia

→ These are organisms which are Eukaryotic, multicellular and heterotrophic. Their cells dont have cell wall and most animal are mobile.

Some terms:-

Coelom:- These are internal body cavity in which well developed organs can be accomodated.

Parasite:- Those organism lives on an organism of another species & benefit by deriving nutrition from that organism.

Triploblastic:- having body made up of 3 cell layers from which differentiated tissues can be made.

Notochord:- It is long rod like support structure that run along back of animal separating the nervous tissues from gut.

Animalia are further classified based on extent and type of the body design differentiation

Porifera:- a) Porifera means organism with holes b) Non-motile and body have pores c) canal system inside body for circulating water and food d) covered with hard outside layer or skeleton.
Example:- spongilla.

Coelenterata:- a) These are animal living in water b) more body design differentiation c) body made up of 2 layer of cell, one for outside layer and other for inner lining of body
Example:- Hydra.

Platyhelminthes :- These organism have a.) complex design b.) bilaterally symmetrical c.) 3 layer of cell i.e Triploblastic which form differentiated tissues d.) some degree of tissue formation e.) No true organ f.) either free living or Parasite

Nematoda :- These organism are a.) bilaterally symmetrical b.) Triploblastic c.) Have tissues but no real organ d.) also known as parasite worm
Ex :- worm inside intestine

Annelida :- These organism are a.) bilaterally symmetrical b.) triploblastic c.) True body cavity d.) Extensive organ differentiation
Example :- leecher, Earthworm

Arthropoda :- These organism are a.) bilaterally symmetrical b.) have open circulatory system (i.e blood doesn't flow in well defined blood vessel) c.) coelomic cavity is blood filled d.) have jointed legs
Example :- Prawn, butterflies.

Mollusca :- These organism are a.) bilaterally symmetrical b.) coelomic cavity is reduced c.) Open circulatory system d.) Kidney like organs for excretion

Protochordata :- These organism are a.) bilaterally symmetrical b.) triploblastic c.) coelom d.) body design have notochord
Example :- Herdmania

Vertebrata :- These organism have a.) true Vertical column b.) internal skelton c.) bilaterally symmetrical triploblastic, coelomic, complex differentiated body

Within Vertebrate further classification:-