THE LIVING WORLD

What is living?

The distinctive characteristics like growth, reproduction, metabolism, replication, self organization etc., exhibited by living organisms is called living

Characteristic features of living or living organisms:

1) Growth
2) Reproduction
3) Metabolism
4) Cellular organization
5) Consciousness
6) Self replication
7) Presence of genetic material

1. GROWTH: Growth is defined as an irreversible increase in the size and mass of an organism due to cell enlargement and cell division.

 A multicellular organisms grows by cell division. In plants growth occur continuously throughout their life span due to-cell division. But, in animals growth occurs only upto a certain age.

In most of the higher plants and animals growth and reproduction a mutual events.

Generally increase in body mass is considered as growth.

Non living objects also grow life we take incre ase in body mass ar criterion for growth.

Eg: Mountains, boulders and sand mounds do grow. Growth is equivalent to increase in cell number or mass.

Intussusceptious:In living organisms, growth occurs internally by cell division. This is called intussusceptions.

Accretion: In nonliving objects, growth occurs externally due to deposition of material on the surface. This is called accretion.

2. REPRODUCTION: 1t is process in which an organism produce   offspring possessing features more or less similar to the parents

There are two types of reproduction namely:

a) Asexual reproduction and

b) Sexual reproduction

a) Asexual reproduction: It is type of reproduction in which progenies are produced from the parent without formation of gametes. It generally occur in lower organisms.

Eg: Fungi reproduce asexually by produce spores.

Yeast & Hydra reproduce asexually by produce buds (budding).

Planaria (flat worms) reproduce asexually by regeneration

Filamentous algae & protonema of mosses reproduce asexually by Fragmentation.

b) Sexual reproduction; It is type of . reproduction in which progenies/offsprings are produced by the formation and fusion of gametes. It occurs in higher organism.

Many orgasims like mules, sterile.worker bee, infertile human couples .etc.. do not reproduce.

3. METABOLISM: The sum total of all chemial reactions occurring in the living .Spme total ot alA chemialreact)s organísms is called metabolism.

All living organisms like plants, animals, fungi, microbase of etc exhibit metabolism.

Metabolism has two main process,namely

1) Anabolism

2) Catabolism

Anabolism: It is à building up or constructive reaction where simple compounds are combined to form larger compounds.

Eg: photosynthesis

b) Catabolism: It is a breakdown or destructive reaction where larger compound breakdown into simple compounds.

Eg: Respiration

4. CELLULAR ORGANIZATION: In mülticellular organisms, cells are organized to from tissue, organs &organ systems.

5. CONSCIOUSNESs: It is the ability to sense the environment and respond to stimuli.Generally, all living organisms have consciousness. They have sense organs which have the ability to sense the environment.

6.SELF REPLICATION: all living organisms have genetic material which has ability to synthesis it's own copies.

7.PRESENCE OF GENETIC MATERIAL: The nuclei acid (DNA&RNA) forms the genetic material in the living organisms.it transmits information from one generation to another.

DIVERSITY IN THE LIVING WORLD/BIODIVERSITY

The different forms living organismpresent on the earth is called biodiversity.

Biodiversity includes microorganisms, plants and animals.There are 1.7 to 1.8 million species of plants and animals are identified so far.

TAXONOMY: The branch of biology deals with study of identification, nomenclature and classification of living organisms is called taxonomy.

NOMENCLATURE: The naming of organisms for identification is called nomenclature.

There are two types of names, namely local and scientific name.the name used by local people of an area for identifying organisms is called local name

Eg:rose etc.

BINOMIAL NOMENCLATURE: The scientific naming of an organism by using two words namely, Generic name and Specific name is called binomial nomenclature.

It was proposed by CAROLUS LINNAEUS

Eg:Magnifera indica.The Magnifera represents genus (generic) name and indica represents species (species) name.

RULES OF B\NOMIAL NOMENCLATURE

1) The scientific name should possess two names, namely Generic name and Specific name.

2) The sdenhfic name should starts With genetic name which is followed by the specific name.

3) The genetic name should starts With capital letter and specific name starts with small letter.

4)The scientific name should be in Latin language.

5)The genetic and specific names shou\d be printed in Italics.

6) The genitic and specific names are underlined separately when hand written.

The rules or .principles of binomial nomenclature were framed by ICBN & ICZN

(ICBN: International code for botanical nomenclature)

(ICZN: International code for zoological nomenclature)

CLASSIFICATION:It is a process of grouping of organisms into categories based on some easily observable charecters.

The units which are used in classification are called categories or taxa.

Taxonomic categories:

The various categories or taxa used in classification are called taxanomic categories.

The system of arrangements of different taxanomic categories during classification is called heirarchy of categories.

Hierarchy of categories was first used by CAROLUS LINNAEUS hence it is also used called linnaean heirarchy.

The linnaean heirarchy consists of 7taxa .they are Kingdom,phylum/division,class,order, family,genus,and species.

Hierarchy of taxanomic categories

kingdom

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  Phylum/division

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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

1. SPECIES: . Species is a group   similar organisms which arencapable of   interbreed and produce fertile offspring.

It is the basic unit of biologic'al classification or taxonomic categories   is the lowest or smallest taxonomic category. The term species was proposed by John Ray

Eg: Panthera leo (Lion), Mangifera indica (Mango) and Solam tuberosum (Potato).

 In all the three leo, indica & tuberosum represents species.

 2. GENUS: It is a taxonomic category higher than the species consists of group related species.

Eg: The Genus Panthera includes Lion, Tiger, Leopard etc.

The Genus Felis includes cats.

The Genus solanum includes potato, brinjal, tomato .

3. FAMILY: It is a taxonomic category higher than the genus consists of group related genera.

Eg: Family Canidae includes genus Panthera and genus canis

Family Felidae include genus Felis.

4. ORDER: It is a taxonomic category higher than the family consists of group of related families.

Eg:Order Carnivora includes families like Felidae and Canidae.

Order polymoniales includes families like convolvulaceae, solanaceae

5. CLASS: It is a taxonomic category higher than the order consists of group of related orders.

Eg: The class M'ammalia includes orders like carnivore (Tiger, Cat , Dog, Lion etc) and primate (Monkey, Gorilla, Man etc.)

6. PHYLUM/DivISION: It is a taxonomic category higher than the class consists of group of related classes.

Eg: phylum chordate includes classes like fishes, amphibians, reptile, aves, mammals.

7. KINGDOM: it is a taxonomic category higher than   the phylum consists. of group of related phyla.

It is the highest and biggest taxanomic category

Eg: Kingdom animalia includes phyla like porifera ,coelentrata,platyhelminthes, Aschehelmithes, annelida,arthropoda,Mollusca,echinodremata and chordata

Organisms with their taxanomic categories

TAXONOMIC AIDS

These are store houses of information and specimens which helps in identification and taxanomic studies of organisms

They are primary sources of information for taxonomic studies.

Common Name	Biological Name	Genus	Family	Order	Class	Phylum/ Division
Man	*Homo sapiens*	*Homo*	Hominidae	Primata	Mammalia	Chordata
Housefly	*Musca domestica*	*Musca*	Muscidae	Diptera	Insecta	Arthropoda
Mango	*Mangifera indica*	*Mangifera*	Anacardiaceae	Sapindales	Dicotyledonae	Angiospermae
Wheat	*Triticum aestivum*	*Triticum*	Poaceae	Poales	Monocotyledonae	Angiospermae

Types
1) Herbarium
2) Botanical gardens
3) Museum
4) Zoological park
5) Keys

1) HERBARIUM: Herbarium is a store house of collected plant specimens where plant are dried, pressed and preserved on sheets.

The herbarium sheets has mounted dried plant specimen along with their descriptions.

It has information about date and place of collection, common name, botanical name, family name of the plant, collector's name etc.,

The herbarium sheets are arranged according to a universal accepted system of classification.

BOTANICAL GARDENS: it is a specialjzed garden where different types of local and exotic plants are developed for the purpose of study reference and research.

The famous and largest botanical garden is Royal Botanical Garden at Kew (England).

Indian largest botanical garden is at Howrah, and at National Botanical Research Institute, Lucknow.

3) MUSEUM: Museum is the store house of collected plant and animal species wht>re plant and animal specimens are preserved in the glass jars using Preservatives for study & reference.

ZOOLOGICAL PARKS: These are the places where wild are kept in   protected natural environments under human care.

They are useful to learn the food habits and behaviour of animals.

5)   KEYS: Key is a taxonomical aid used for identification of plant and animals based on the similarities and dissimilarities.

Key has pair of ·contrasting· Character or statements called Couplet.

  It represents the choice, made between two opposite options.

Each statement of the key is called lead.

some other taxonomic aids

Flora, manual, monographs and catalogue are some other taxonomical aids of recording description. They also help in correct indentification.

  1) Flora: It contains account and distribution of plants of a given area.

  2) Manuals: They provide information for identification of names of species found in an area.

  3) Monograph: It contains information on any one taxon.

Importance of taxonomic acids :

1) They help in taxonomic studies of plants, animals and microbes.

2) They help in knowing uses of plants & animals in agriculture, industry etc.

3) They help in knowing bio diversity.

  4) They help in knowing bio resources.

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