

**Chapter-1 The Living World**

**Introduction:-** The environment in which we live consists of so many things which can be divided in there groups.

(1) Living things            (2) Non living things        (3) Dead things

(1) Living things:- it includes all types of living beings like all kings of plants and animals, both of these Constitute the living word.

**Characteristics of living beings:-** Living beings are Unique because they express a characteristic level of organization. Body of all living beings (organism) Consist of cells which contains a living substance called protoplasm a port from this living organism show the following life processes which can distinguish a living from Non living.

- (a) Growth and Development.
- (b) Cellular Organization
- (c) Nutrition
- (d) Meta bolism
- (e) Shape and size
- (f) Movement and locomotion
- (g) Reproduction
- (h) Irritability
- (i) Life cycle
- (j) Death

(2) Non Living things:- It includes all the nonliving objectives which do not show living charecters and have never been alive hence known as Nonliving things such as Air. Water, Soil, stone etc.

(3) Dead Things:- it includes wood, bone, dead parts of planas like, leaves, sterms and roots which had been alive once are dead now.

**BIODIVERSITY**

There are more than 1.7 to 1.8 million species described and several more to be discovered yet all these plants and animals exhibit variation interms of their size, External appearance, internal structure, physiological process, adaptation to environment and forms of reproduction. So Variation found in different organism are called as diversity of life or Biodiversity.

**NEED OF CLASSIFICATION**

The immense biological diversity we now see it is not-Possible for a man to study all the plants and animals during his lifetime. Variation posed a great problem to human being for their study. There for from the be ginning at the human civilization people felt the necessity for arranging the main different groups. So by studying a single Organism of that group we can form a general Idea about the general and anatomical characters of all the member's of the group. There fore classification of all organism is necessary to make their study easy classification also makes following easy.

- (I) It helps to Understand diversity in plants and animals
- (II) It helps us to establish the natural relationship among Organism.
- (III) It helps to identify the Organism
- (IV) It gives us evidence for Organic Evolution

### **TAXONOMY**

" Taxonomy is the functional science which deals with Identification, nomenclature and classification of Different kind of Organism all over the world.

**Basics of Taxonomy**-are

(A) Identification (B) Classification (c) Nomenclature

**(1) Introduction:-** it means determination of correct place of an Organism in a previously established plan of classification.

**Species:-** The Unit of Classification in both plants and animals is species. it may be defined as "Population of Individuals with similar structural, and functional Characteristics which have Common ancestry and in nature breed only with each others"

**General Characters of Species.**

- (A) They show similar morphological characters.
- (B) They Can Interbreed freely and truly in nature, they produce fertile offsprings.
- (C) Ordinarily they Can not breed with other species.

**(2) Classification:-** it is the system of arrangement of Organism in to groups showing relationship. in this various plants and animals are kept in different categories based on particular characters.

**Category:-** Plants and animals are ranked in an arrangement of known Categories Such as Kingdom, Phylum. Class etc.

**Taxon ( Texa=Plural)**- The taxa are the groups of animals generally groups of species.

**HIERARCHIAL LEVELS OF CLASSIFICATIONS:-** Hierarchy means a series or succession of different- ranks. In Biological Classification Hierarchy is a system of arrangement for classification in which taxonomic categories are placed in a Subsequent way on the basis of Characteristics and Evolution of the Organisms.

The hierarchy of categories Consists of descending sequence of seven Categories such as

1. Kingdom
2. Phylum
3. Class
4. Order
5. Family
6. Genus
7. Species

These are main Seven Categories of Classification now we will explain from species of kingdom.

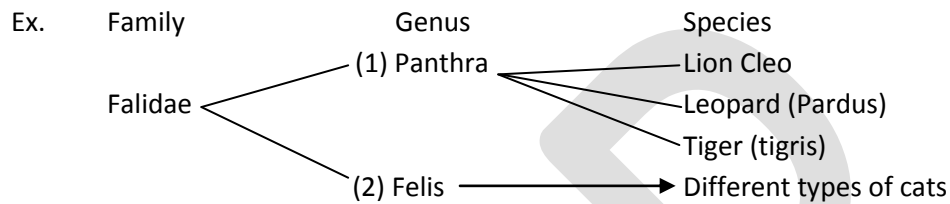
**(a) Species:-** It is basic unit of taxonomy and evolution

**(B) Genus (Plural- Genera)** it is Second Category of classification it is group of Similar Species All species of same genus are similar in some characters these characters are not found in different species Example Panthra is a genus and 3 species belongs to this group.

Common Name	Genus	Species
Lion	Panthra	Lio
Leopard	Panthra	Pardus
Tiger	Panthra	Tigris

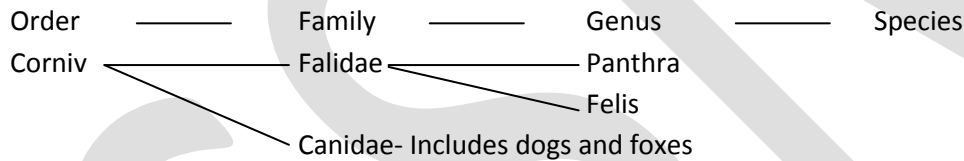
Organism of genus Panthra are similar in certais Charecters

**(C) Family:-** A number of genera having several common charecters froms a family.



**(D) Order:-** It Consists of one or more families having certain common characters which differ from families of other orders in some dignostic characters.

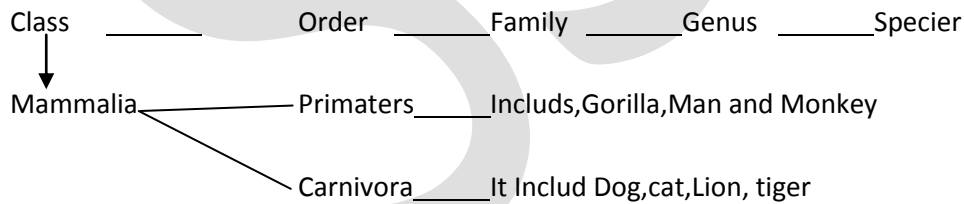
Example



Orders in cluds. Super Orders, Sub oriers

**(E) Class-** It Consists of one or more orders having certain Common characters Which differ from orders of other classes in some characters.

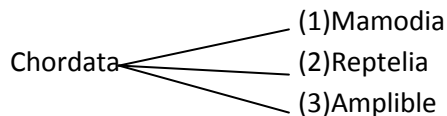
Ex.



**(F) Phylum-** Many Classes with some comnan charecters are includes in a Phylum

Ex.

Phylum \_\_\_\_\_ Class \_\_\_\_\_ Order \_\_\_\_\_ Family \_\_\_\_\_ Genus \_\_\_\_\_ Species.



Phylamayble Sub divided in to super phyla and sub phyls.

**(G) Kingdom-** This is the highest category of classification Example All animals are Included in the animal Kingdom and all plants are Included in Plant Kingdom.

**NOMENCLATURE**

Naming the species is known as nomenclature. When a taxonomist identifies and describe the natural group of organism be give appropriate scientific name to the group.

**(H) Necessity of Nomenclature:-** The use of native or common name of ten creats confusion very of ten a particular organism has different name indifferent regions of the world. For example the common house sparrow is called Gauriya in north India, Pichehuka in Andra Pradesh, House sparrow in England, Pardal in Spain, Suzune in Japan and so on if a person goes to some other place then he will not able to understand about the bird unless he see it. To solve this problem a scientific name has to be given to a perticular organism which is Uniform all over the world.

Various systems of nomenclature has been Introduced for naming organism. Which are as follow.

**(I) Polynomial system of classification:-** it is the first system of scientific namonclation in this system name of Organism given in descriptive manner which involve all the main charecters of that organism. but such names are so lengthy and difficult to remember them. So this system is not practically possible.

**(II) Binomial Nomenclature:-** Carolus Linnaeus Introduced binomial nomenclature in his tenth edition of "Systema Naturae" Published in 1758 he used lation word to name plants and animals binomial nomenclature is the system of naming every organism vsing latin words. The first word is generic name and second word is specific name.

**for Example:-** Lion has its scientific name as Panthra leo panthra is ageneric name and lio is the specific name.

**(III) Trinomial system of Classification:-** Some time organism of some species differ from each other as they are adapted for different kinds of Environment. In such cases species are againdevided in to sub species. Thus scientific name of such organism Consist of three words. The first word represent generic name, second eord is specific name and third word is the subspecies. This system of naming the organism using three words is called Trinomial nomenclature.

**for example:-** Crows of India, Burma (Myanmar) and Srilanka differ from each other thus they are divided in to three.

<b>Subspecies.</b>	<b>Genus</b>	<b>Species</b>	<b>Subspecies.</b>
(1) Indian Crow	Corvus	splendens	Splendens
(2) Burmese Crow	Corvus	splendens	Insolens
(3) Crow of Srilanka	Corvus	Splendens	Protagalus

**PRINCIPLE OF NOMENCLATURE/ INTERNATIONAL RULES OF NOMENCLATURE :-**

In the Year 1898 International congress of Botany set the various rules for nomenclature. ICBN ( International Code of Botanical nomenclature and ICBN (International Code of Zoological

nomenclature) set the aims of nomenclature which make the stability in naming the taxa, avoiding the use of name which may cause error, ambiguity or confusion. few commonly followed rules according to principle of nomenclature are given below.

- (1) Plants and animals should be given Independent names.
- (2) System of nomenclature adopted must be binomial to indvate the name of species and trinomial for the name of subspecies.
- (3) Scientific names must be in latin or Greek word.
- (4) First word of name is the generic name which begins with a capital letter, second species and third if present will be subspecies or variety should begin with a small letter.
- (5) Scientific name should be printed in italics..
- (6) Correct and original spelling of a name should be maintained.
- (7) The name of author should he written after the species name in Roman type and without comma between them.

Example:- Homo sapieris Lionalus

- (8) The name should be easy to pronounce.
- (9) The name should not contain less than three and more than twelve letters.

**Advantage of Biological Nomenclature:-**

- (1) Every species has a single name consisting two words generic and specific.
- (2) The biological names are the same all over the world.
- (3) A wrong name can easily be corrected
- (4) They are definite and Universally accepted.
- (5) Biological names have been derived mostly from Latin Greek language. Both of these are dead languages. Hence there is no chance of change in meaning of their words.

**TAXONOMICAL TOOLS**

Organisms are to be identified on the basis of Intensive laboratory and field students. Specimens are preserved and stored for future studies. some of the techniques followed are.

**HERBARIUM**

"a herbarium is a collection of well drive and nicely preserved plants which are correctly identified and arranged according to an appropriate approved system of classifications". The plants are usually pressed and mounted on the sheets of paper known as herbarium sheets. The work on preservation of plants was started in 16th century when Caesalpino preserved the plants material he studied.

**Purpose of herbarium:-** Simple drawing, photographs and written descriptions are insufficient to provide the morphological and development details about the plants. So it become naccenary for taxonomist to compare the newly collected plants with the specimens already collected and preserved in herbarium, for the required description.

**Purposes served by herbaria are:-**

- (1) To serve as the reference material for modern taxonomical research
- (2) To provide scientific information on plants to people through exhibition, training courses.

Important herbaria of India are.

- (1) Central National herbaria (Kolkata)
- (2) Herbarium of forest research institute (Dehradun)
- (3) Herbarium of NBRI (Lucknow)

### **BOTANICAL GARDENS**

A Botanical garden is a place where there is an assemblage of living plants maintained for botanical teaching and research purpose.

In India the first garden was originated in Bombay in 1830 by Agricultural society.

#### **Important Botanical Gardens.**

- (1) Royal Botanical Garden, Kew, England.
- (2) Indian Botanical Garden, Howrah (WB)
- (3) National Botanical Garden Lucknow.
- (4) Leoyd Botanical Garden, Darjeeling.

### **ZOOLOGICAL PARKS**

These are human made places where animals are provided with conditions as similar as possible to their natural habitats.

#### **Significance of Zoological Parks.**

- (1) These inform about mode of living, feeding habitat and behavior of wild animals.
  - (2) Their scientific purpose is to breed the threatened animals to increase their number to prevent their Extinction.
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