

DIVERSITY AND CLASSIFICATION

1 DIVERSITY IN THE LIVING WORLD

Biodiversity refers to the variety of living organisms present on Earth.

Living organisms differ in their:

- Structure and size
- Habitat
- Nutrition
- Reproduction
- Life processes



Examples: Bacteria, fungi, plants and animals.

2 NEED FOR CLASSIFICATION

Biological classification is the systematic grouping of organisms based on their similarities and differences.

Importance

- ✓ Makes the study easier.
- ✓ Helps in identification.
- ✓ Shows similarities and differences.
- ✓ Helps understand relationships.
- ✓ Provides a systematic study of biodiversity.



3 FIVE-KINGDOM CLASSIFICATION

Proposed by
R.H. Whittaker in 1969.

Kingdom	Main Characteristics	Examples
Monera	Unicellular, prokaryotic	Bacteria
Protista	Mostly unicellular, eukaryotic	Amoeba, Euglena
Fungi	Heterotrophic, absorptive nutrition	Yeast, Mushroom
Plantae	Multicellular, autotrophic	Fern, Mango
Animalia	Multicellular, heterotrophic	Human, Fish

4 PROKARYOTIC AND EUKARYOTIC ORGANISMS

Prokaryotic

- No true nucleus.
- Membrane-bound organelles absent.
- Generally unicellular.
- **Example:** Bacteria.



Eukaryotic

- True nucleus present.
- Membrane-bound organelles present.
- May be unicellular or multicellular.
- **Examples:** Amoeba, plants, animals and fungi.



5 AUTOTROPHIC AND HETEROTROPHIC NUTRITION

Autotrophs

- Prepare their own food, generally through photosynthesis.
- **Example:** Green plants.



Heterotrophs

- Obtain food from other organisms.
- **Examples:** Animals and fungi.



PLANT DIVERSITY

6 MAJOR PLANT GROUPS

Plants are classified based on features such as body structure, vascular tissues, seeds and reproductive methods.

A. ALGAE

- Mostly aquatic.
- Simple plant body.
- Example:** *Spirogyra*.



Spirogyra

B. BRYOPHYTES

- Non-vascular plants.
- Found in moist places.
- Example:** Moss.



Moss

C. PTERIDOPHYTES

- Vascular tissues present.
- Reproduce by spores.
- Example:** Fern.



Fern

D. GYMNOSPERMS

- Naked seeds.
- Usually woody plants.
- Example:** *Pinus*.



Pinus

E. ANGIOSPERMS

- Flowering plants.
- Seeds enclosed in fruits.
- Most diverse group.
- Example:** Mango.



Mango

7 MONOCOTS AND DICOTS

Feature	Monocots	Dicots
Cotyledons	One	Two
Leaf venation	Parallel	Reticulate
Root system	Fibrous	Tap root
Example	Wheat, Maize	Pea, Mango



**Monocot
(Wheat)**



**Dicot
(Pea)**

8 PLANT GROUPS – QUICK COMPARISON

Algae

Simple body, mostly aquatic.

Bryophytes

Non-vascular, moist habitats.

Pteridophytes

Vascular, spore-producing.

Gymnosperms

Naked seeds.

Angiosperms

Flowers and enclosed seeds.

9 MAJOR ANIMAL GROUPS

Group	Key Feature	Example
Porifera	Pore-bearing body	Sponge
Cnidaria	Stinging cells	Hydra
Platyhelminthes	Flat body	Tapeworm
Nematoda	Round body	Ascaris
Annelida	Segmented body	Earthworm
Arthropoda	Jointed appendages	Cockroach
Mollusca	Soft body	Snail
Echinodermata	Spiny skin	Starfish
Chordata	Notochord present at some stage	Fish, Human

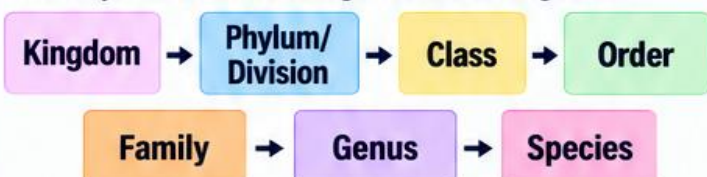
10 VERTEBRATES

Vertebrates are animals possessing a vertebral column.

Fishes	Amphibians	Reptiles	Birds	Mammals
 • Aquatic. • Breathe through gills. • Example: Rohu.	 • Live in water as well as on land. • Example: Frog.	 • Dry, scaly skin. • Mostly terrestrial. • Example: Snake, Lizard.	 • Body covered with feathers. • Forelimbs modified into wings. • Example: Pigeon.	 • Have mammary glands. • Usually give birth to young ones. • Example: Human, Cow.

11 TAXONOMIC HIERARCHY

The major taxonomic categories are arranged as:



Species is the basic unit of biological classification.

Human Classification

Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Primates
Family	Hominidae
Genus	<i>Homo</i>
Species	<i>Homo sapiens</i>

12 BINOMIAL NOMENCLATURE

Binomial nomenclature is the scientific system of naming organisms using two names:

- 1 **Genus**
- 2 **Species**

It was systematically developed by **Carolus Linnaeus**.

Example: Human → *Homo sapiens*

Rules

- 1 Genus begins with a capital letter.
- 2 Species begins with a small letter.
- 3 Scientific names are generally written in italics.