

Biology (class-1x)
Chapter - 7 (Diversity in Living Organisms)

Introduction

Q) Why do we classify organism?

ANS) There are a wide range of life forms (about 10 million - 13 millions species) around us. These life forms have existed and evolved on the earth over million of years ago. The huge range of these life forms makes it very difficult to study them one by one. Therefore, we look for similarities among them and classify them into different classes to study these different classes as a whole. Thus, classification makes our study easier.

Q) Give three examples of the range of variation that you see in life forms around you.

ANS) Examples of range of variations observed in daily life are:

(i) Variety of living organisms in terms of size ranges from microscopic bacteria to tall trees of 100 meters.

(ii) The colour, shape, and sizes of snakes are completely different from those of lizards.

(iii) The life span of different organisms is also quite varied. For example, a crow lives for 15 years, whereas a parrot lives for about 140 years.

BASIC OF CLASSIFICATION

The method of arranging organisms into groups or sets on the basis of similarities and differences is called classification. Similarities and differences of organisms show their relationships.

Importance of classification

The science of classification is known as taxonomy.

Classification of living organisms has following advantages:

- (i) Classification makes the study of wide of a variety of organisms easy.
- (ii) Classification projects before us a picture of all life forms at a glance.
- (iii) Classification forms a base for the development of other biological sciences.

Ancient Greek thinker Aristotle classified living beings on the basis of their habitat. He classified them into two groups, i.e. those living in water and those living on land. But his classification was too simple to justify inclusion of a particular organism into a particular group.

Some examples of scientific bases of classification are as follows:

(a) Prokaryotes: When nucleus is not organised i.e. nuclear material are not membrane bound; the organism is called prokaryote.

(b) Eukaryotes: When nucleus is organised, i.e. nuclear material are membrane bound; the organism is called eukaryote.

Number of cells: An organism can be composed of a single cell or many cells. An organism with a single cell is called unicellular organism. On the other hand, an organism with more than one cell is called multicellular organism.

Mode of Nutrition: On this basis organisms can be divided into two broad groups i.e. autotrophs and heterotrophs. An autotroph makes its own food, while a heterotroph depends on other organism for food.

Level of Organisation:

Even in case of multicellular organisms, there can be different levels of organization. When a cell is responsible for all the life processes, it is called cellular level of organization. When some cells group together to perform specific function, it is called tissue level of organization. When tissues group together to form organs, it is called organ level of organization.

Similarly organ system level of organization is seen in complex organisms.

Q) What do you think is a more basic characteristic for classifying organisms?

- (i) The place where they live.
- (ii) The kind of cells they are made of. Why?

Ans) The kind of cells that living organisms are made up of is a more basic characteristic for classifying organisms. This is because on the basis of the kind of cells, we can classify all living organisms into eukaryotes and prokaryotes. On the other hand, a habitat or the place where an organism lives is a very broad characteristic to be used as the basis for classifying organisms. For example, animals that live on land include earthworms, mosquitoes, butterfly, rats, elephants, tigers etc. Therefore, the nature or kind of cell is considered to be a fundamental characteristic for the classification of living organisms.

Q) What is the primary characteristic on which the first division of organisms is made?

Ans) Nature of cell - whether it is prokaryotic or eukaryotic.

Q) On what basis are plants and animals put into different categories?

Ans) ... on basis of their ability to obtain their own food. Plants can make their own food by the process of photosynthesis while animals obtain food from other organisms.

CLASSIFICATION AND EVOLUTION

It is a well established fact that all the life forms have evolved from a common ancestor. Scientists have proved that the life began on the earth in the form of simple life forms. During the course of time, complex organisms evolved from them. So, classification is also based on evolution. A simple organism is considered to be primitive while a complex organism is considered to be advanced.

Q) Which organisms are called primitive and how are they different from the so-called advanced organisms?

Ans) A primitive organism or lower organism is the one which has a simple body structure and ancient body design or features that have not changed much over a period of a time. An advanced organism or higher organism has a complex body structure and organisation. For example, an Amoeba is more primitive as compared to a starfish. Amoeba has a simple body structure.

(Q) Will advanced organisms be the same as complex organisms? Why?

(ANS) Yes. It is because the 'advanced' organisms were also like the primitive one once. They have acquired their complexity relatively recently. There is a possibility that these advanced or 'younger' organisms acquire more complex structures during evolutionary time to compete and survive in the changing environment.

The Hierarchy of Classification Groups

Five kingdom classification by Robert Whittaker (1959)

This is the most accepted system of classification.

The classification Whittaker proposed has five kingdoms: Monera, Protista, Fungi, Plantae and Animalia.

These groups are formed on the basis of their cell structure, mode and source of nutrition and body organisation.

Further classification is done by naming the sub-groups at various levels as given in the following scheme:

Kingdom

Phylum (for animals) / Division (for plants)

Class

Order

Family

Genus

Species.

Thus, by separating organisms on the basis of a hierarchy of characteristics into smaller and smaller groups, we arrive at the basic unit of classification, which is a 'species'.

(1) MONERA

These are prokaryotes; which mean nuclear material are not membrane bound in them. They may or may not have cell wall.

The mode of nutrition of organisms in this group can either by synthesising their own food (autotrophic) or getting it from the environment (heterotrophic)

All organisms of this kingdom are unicellular.

Examples: bacteria, blue green algae (cyanobacteria) and mycoplasma.

(Q.) What are the characteristics of kingdom Monera?

- ANS) (i) The organisms do not possess a clearly defined nucleus, i.e. the nucleus is not enclosed by a nuclear membrane.
- (ii) Cell organelles are not covered with a membrane
- (iii) Organisms are unicellular, microscopic prokaryotes living in moist condition.
- (iv) Cell wall may or may not be present.
- (v) The mode of nutrition may be autotrophic or heterotrophic.
- (vi) Reproduction is primarily asexual by binary fission or budding.

(2) PROTISTA

These are eukaryotes and unicellular. They can be autotrophic or heterotrophic. Examples: unicellular algae, diatoms and protozoans. Main features:

- (i) Most of the members are unicellular and primarily aquatic.
- (ii) They have nucleus and typical eukaryotic cell organelles.
- (iii) Most of the organisms bear flagella or cilia for movements.
- (iv) Mode of nutrition is absorptive, ingestive or photo-autotrophic.
- (v) Reproduction may be asexual or sexual.

(3) FUNGI

These are heterotrophic and cell wall. The cell wall is made of chitin. Most of the fungi are unicellular. Many of them have the capacity to become multicellular at certain stage in life. They feed on decaying organic material. Such a mode of nutrition is called saprophytic. Example: yeast, penicillium, aspergillus, mucor etc.

Q.) Give the main features of kingdom Fungi

- ANS) (i) They are non-green because of the absence of chlorophyll.
- (ii) They are heterotrophic and obtain food from dead and decaying organic matter by absorption.
- (iii) The body organisation is mycelial or secondary unicellular.
- (iv) Cell wall is chitinous and cellulose
- (v) Asexual reproduction is by spore formation. Some also exhibit sexual reproduction.

(4) PLANTAE

These are multicellular and autotrophs. Presence of chlorophyll is a distinct characteristic of plants, because of which they are capable of doing photosynthesis. Cell wall is present.

Q.) Write the main characteristics of kingdom plantae.

- ANS) (i) They are all complex multicellular plants which prepare their own food by photosynthesis.
- (ii) They possess cell wall made of cellulose
- (iii) Plants are immobile and do not show locomotion
- (iv) They have unlimited growth and grow throughout their lives.

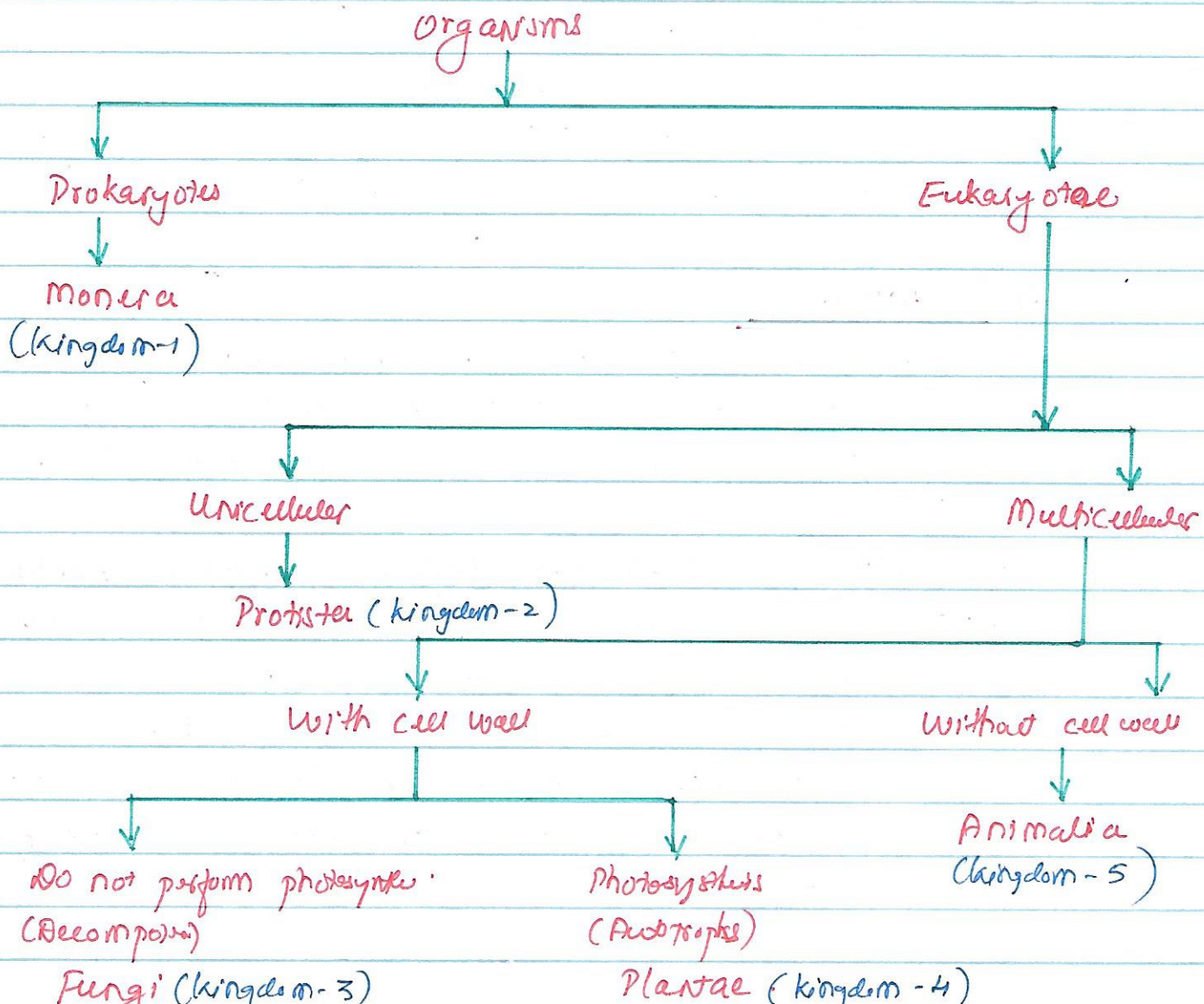
5) ANIMALIA

These are multicellular and heterotrophs. Cell wall is absent.

General Characteristics:

- (i) In kingdom Animalia, all the members multicellular eukaryotes with tissue differentiation.
- (ii) They are heterotrophic with ingestive mode of intake of food.
- (iii) They possess a well developed nervous system.
- (iv) Muscular system is also well developed for locomotion.
- (v) They exhibit sexual reproduction.

Examples: Sponge, molluscs, fishes, birds, reptiles and mammals all belong to kingdom Animalia.



Q) What is the criterion for classification of organisms as belonging to kingdom Monera or Protista?

ANS) Prokaryotes belong to the kingdom Monera and single-celled eukaryotes belong to the kingdom Protista.

Q) In which kingdom will you place an organism, which is single-celled, eukaryotic and photosynthetic?

ANS) Protista.

Q) In the hierarchy of classification, which grouping will have the smallest number of organisms with a maximum of characteristics in common and which will have the largest number of organisms?

ANS) Species will have the smallest and kingdom will have the largest number of organisms.

Q) Which organisms are called primitive?

ANS) Primitive organisms are those which have ancient body design and have not changed very much with the passage of time.

Q) Name the branch of science that deals with classification.

ANS) Taxonomy.

Q) Who was the first to classify animals according to their habitats? ANS: Aristotle.

Q) What is evolution?

ANS) The life forms that exist today have risen because of changes in their body design over a course of time to adapt themselves in the changing conditions. This is called evolution.

Q) What is a genus?

Ans) A genus is a group of related species.

Q) Which groups of organisms do not have a defined nucleus or organelles? Ans: Monera.

Q) What is a species? Give its main features.

Ans) Species is defined as a group of organisms, which resemble each other in all essential aspects, i.e. structure and function, and interbreed to produce fertile young ones of their own kind.

They have descended from a common ancestor and have similar genetic material.

Q) Explain the basis for grouping organisms into five kingdoms.

Ans) (i) Nature of the cells, i.e. either prokaryotic or eukaryotic.
(ii) Number of cells, i.e. unicellular or multicellular.
(iii) Presence or absence of cell wall
(iv) Mode of nutrition, i.e. autotroph or heterotroph.

Q) What are the advantages of classifying organisms?

Ans) (i) It gives us information regarding the diversity of plant and animals.
(ii) It makes the study of different kinds of organisms much easier.
(iii) It helps us about the inter relationship among the various organisms.
(iv) It helps us understand the evolution of organisms.
(v) It helps in the development of other life sciences.

Diversity in Living Organism (class IX)

Topic - 2

Plantae

The plant kingdom can be further classified into five divisions. Their key characteristics are given below:

(1) Thallophyta (algae)

The plant body is simple thallus type. The plant body is not differentiated into root, stem and leaves. They are commonly known as algae. Examples: Spirogyra, Chara, Volvox, Ulothrix etc.

Q) Give the main features of algae.

- (i) They are autotrophic as they possess chlorophyll.
- (ii) They are mainly aquatic but some also grow in moist places.
- (iii) The body is not divided into root, stem and leaves.

(2) Bryophyta

Plant body is differentiated into stem and leaf like structure. Vascular system is absent, which means there is no specialized tissue for transportation of water, mineral and food. Bryophytes are also known as the amphibians of the plant kingdom, because they need water to complete a part of their life cycle. Example: Moss, Marchantia.

Q) Give the important features of division Bryophyta.

- (i) Bryophytes are called the amphibians.
- (ii) Vegetative reproduction is very common.
- (iii) The plant body is commonly differentiated to form stem and leaf-like structures.
- (iv) Sexual reproduction is of oogamous type i.e. the male gamete is small and motile and female gamete is non-motile and large. eg. moss, Funaria, Marchantia.

(3) Pteridophyta

Plant body is differentiated into root, stem and leaf.

Vascular system is present. They do not bear seeds and hence are called cryptogams. Plants of rest of the divisions bear seeds and hence are called phanerogams.

Examples: Marsilea, ferns, horse tail etc.

Q) Give the main features of Pteridophyta.

(i) The plant body is divided into root, stem and leaves.

(ii) The fertilised eggs form embryo.

(iii) They are also called vascular cryptogams as they have a developed vascular system.

(iv) They have multicellular reproductive system.

(4) Gymnosperms

They bear seeds. Seeds are naked i.e. are not covered.

The word 'gymnos' means naked and 'sperma' means seed.

They are perennial plants. Example: Pine, cycas, deodar etc.

(5) Angiosperms

The seeds are covered. The word 'angios' means covered.

There is great diversity in species of angiosperm. Angiosperms are also known as flowering plants, because flower is a specialised organ meant for reproduction. Angiosperms are further divided into two groups, viz. (i) monocotyledonous

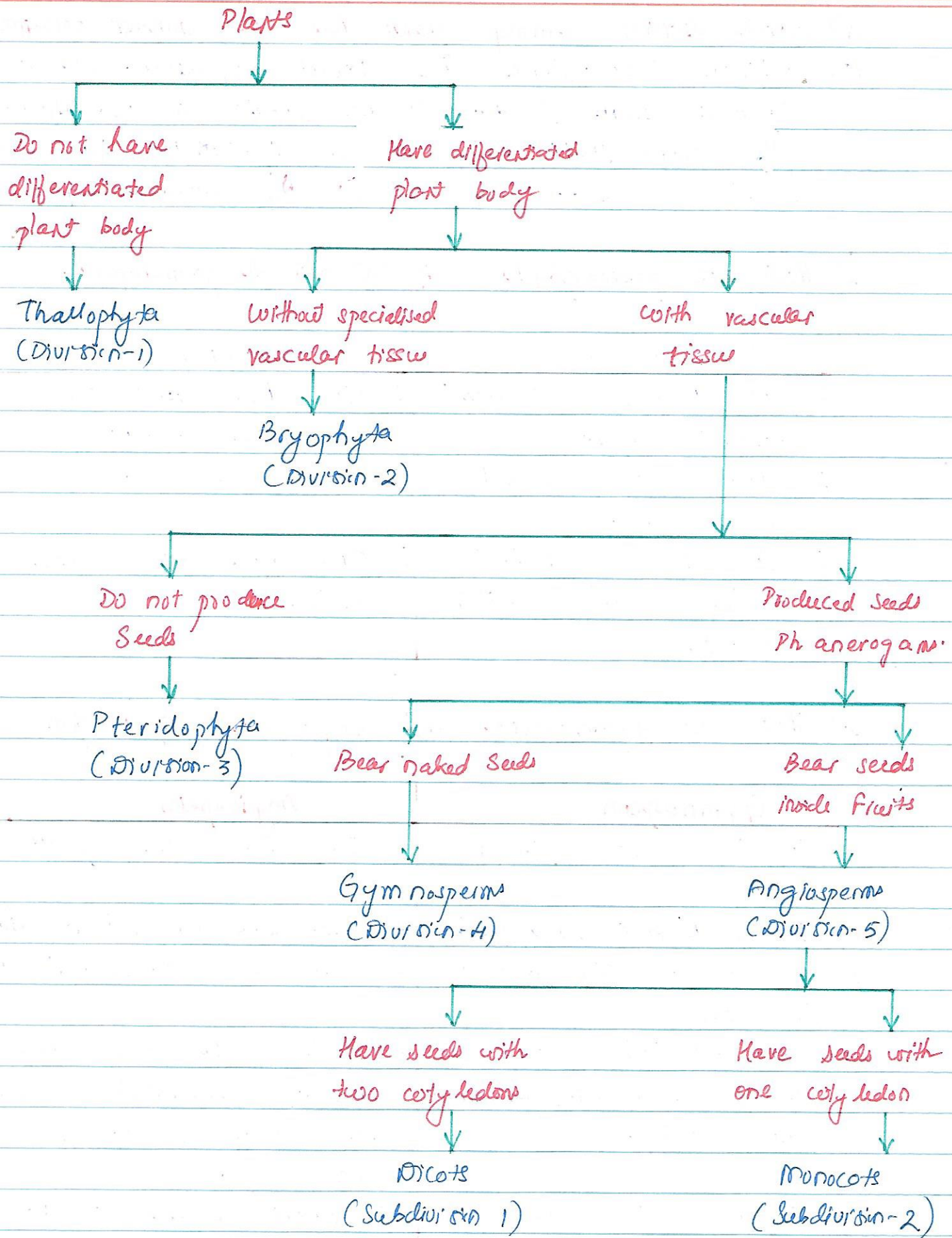
(ii) dicotyledonous.

(a) Monocotyledonous: There is single seed leaf in a seed.

A seed leaf is a baby plant. Example: wheat, rice, maize.

(b) Dicotyledonous: They have two cotyledons in a seed.

Examples: Mustard, gram, mango etc.



Q7) Which division among plants has the simplest organisms?

Ans) Division Thallophyta has simplest organisms. This group includes plants, which do not contain a well differentiated plant body. Their body is not differentiated into roots, stems and leaves. They are commonly known as algae.

Q8) How are pteridophytes different from the phanerogam?

Pteridophyta	Phanerogam.
(i) They have less differentiated reproductive organ.	(i) They have well developed reproductive organ.
(ii) They produce naked embryos called spores.	(ii) They produce seeds.
(iii) They have specialised tissue for the conduction of water.	(iii) They have proper vascular tissues.

Q9) How do gymnosperms and angiosperms differ from each other?

Gymnosperm	Angiosperm
1) They are non-flowering plants.	1) They are flowering plants.
2) The plants bear naked seeds.	2) Seeds are enclosed in fruit.
3) Ovules are not enclosed in ovary.	3) Ovules are enclosed in ovary.
4) Plants of this group are usually evergreen, perennial and woody.	4) Plants of this group may be annual, biennial or perennial. They may be woody or non-woody.
5) Xylem lacks vessel.	5) Xylem contains vessels.
6) Phloem does not contain companion cells.	6) Phloem contains companion cells.

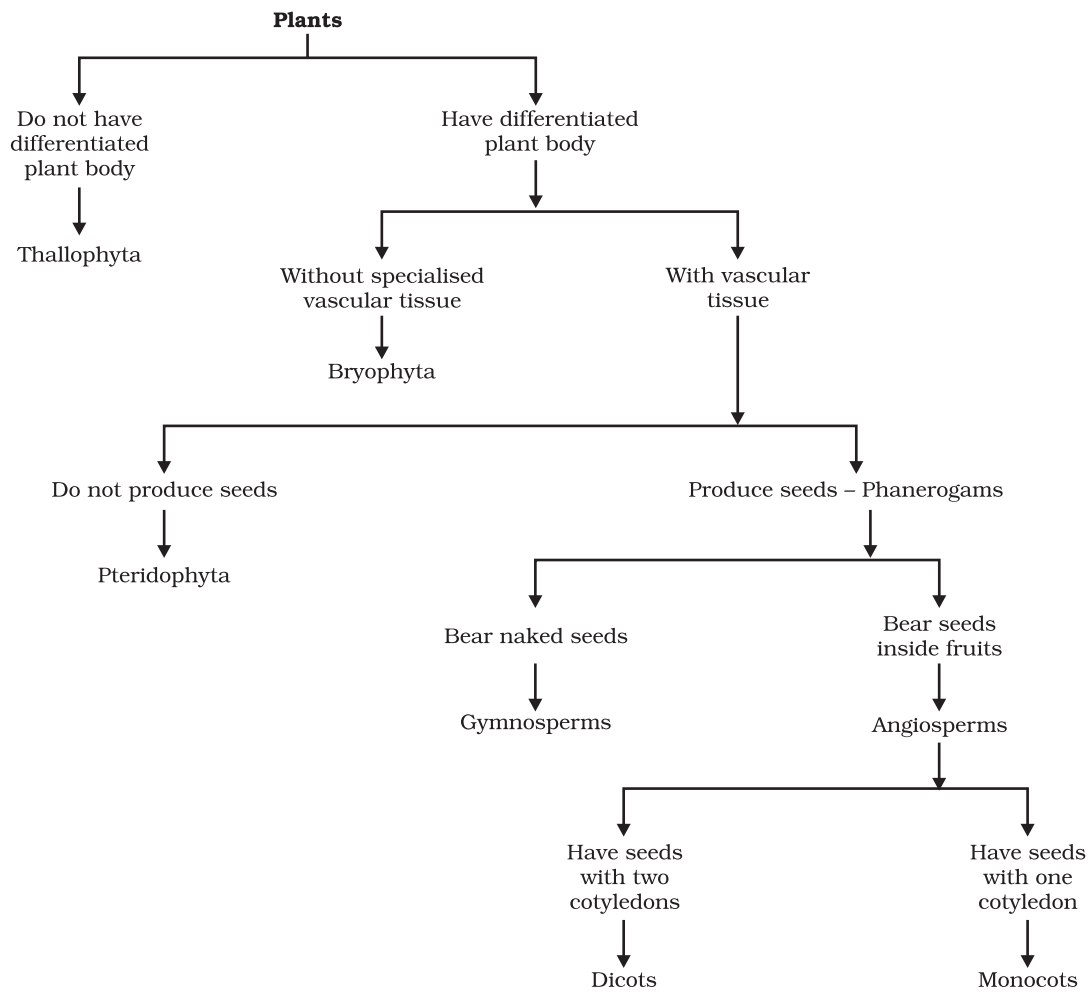


Fig. 7.11: Classification of plants

Activity 7.2

- Soak seeds of green gram, wheat, maize, peas and tamarind. Once they become tender, try to split the seed. Do all the seeds break into two nearly equal halves?
- The seeds that do are the dicot seeds and the seeds that don't are the monocot seeds.
- Now take a look at the roots, leaves and flowers of these plants.
- Are the roots tap-roots or fibrous?
- Do the leaves have parallel or reticulate venation?

- How many petals are found in the flower of these plants?
- Can you write down further characteristics of monocots and dicots on the basis of these observations?



Questions

1. Which division among plants has the simplest organisms?
2. How are pteridophytes different from the phanerogams?
3. How do gymnosperms and angiosperms differ from each other?

Diversity in Coelom Organism (class 11)

Topic-3

ANIMALIA

These are organisms which are eukaryotic, multicellular and heterotrophic. Their cells do not have cell-walls.

Most animals are mobile.

They are further classified based on the extent and type of the body design differentiation found.

(1) PORIFERA

The word means organism with holes. These animals have pores all over their body. The pores lead into the canal system. Water flows through the canal system and facilitates entry of food and exchange of other materials. The animal is not differentiated into tissues. The body is covered with a hard outer skeleton. These are commonly known as sponges. They are marine animals.

Example: Sycon, Spongilla, Euplectelea etc.

(2) Give the main features of the phylum Porifera.

(i) They are primitive animals.

(ii) They are generally multicellular organisms with specialised cells but these cells do not group together to form tissues.

(iii) Most of them are marine, i.e. found in the seas.

(iv) They possess pores all over the body.

(v) Reproduction can be both sexual and asexual methods.

(vi) Sensory system is absent.

(vii) Mouth and anus are absent.

(viii) A distinct canal system with inlets and outlets for water circulation inside the body is present.

They obtain food and oxygen by means of water.

Examples: Sycon, Spongilla and Euplectella.

(2) COELENTERATA

These are animals living in water. They show more body design differentiation. There is a cavity in the body. The body is made of two layers of cells: one makes up cells on the outside of the body, and other makes the inner lining of the body. Some of these species live in colonies (corals), while other have a solitary like-species (Hydra). Examples: Jellyfish and sea anemones.

(Q) Give the main features of coelenterates.

- (i) Diploblastic animals with tissue level organisation in the body.
- (ii) The body is radially symmetrical.
- (iii) The body bears tentacles supplied with special stinging cells called cnidoblasts.
- (iv) There is a cavity in the body.
- (v) Body is made up of two layers of cells.
- (vi) Example: Hydra, Obelia and Jellyfish.

(Q) How do poriferan animals differ from coelenterate animals?

Poriferan animals	Coelenterate animals.
(1) These organisms have minute pores called ostia all over the body and a large opening called osculum at the top.	(1) These organisms have a single pore.
(2) Body is made up of single layer of cells.	(2) Body is made up of two layers of cells.
(3) Canal system for circulating water throughout the body present.	(3) No water canal system in the body.
(4) External skeleton present.	(4) Skeleton absent.
(5) These are non-motile.	(5) These are motile animals.
(6) Tentacles are absent.	(6) Tentacles are present.

(3) PLATYHELMINTHES

The body is flattened from top to bottom and hence the name platyhelminthes. These are commonly known as flatworms. The body wall is composed of three layers of cells (triploblastic). Because of three layers, it is possible to form some organs as well. But a proper coelom is absent in platyhelminthes and hence proper organs are absent. They are free-living or parasitic animals.
Examples: Planaria, Liver fluke, Tapeworm etc.

(8) Describe the features of phylum Platyhelminthes.

- (i) They show bilateral body symmetry.
- (ii) Their body is flattened like a ribbon. So they are called flatworm.
- (iii) Most of them are parasitic, only a few are free living.
- (iv) They are mostly hermaphrodites.
- (v) There are three embryonic layers of cells in their body. So, they are triploblastic.
- (vi) Their body does not have any pore or cavity.
- (vii) They have power of regeneration.

Examples: Fasciola (Liver fluke) and Planaria Solium.

(4) NEMATODA (NEMATHELMINTHES)

- (i) The body is bilaterally symmetrical and triploblastic. However, the body is cylindrical rather flattened.
- (ii) There are tissues, but no real organs.
- (iii) A pseudocoelom is present and hence organs are absent.
- (iv) These are very familiar as parasitic worms causing diseases, such as the worms causing elephantiasis (filarial worms) or the worms in the intestines (roundworm or pinworm).
- (v) Examples: Ascaris, Wuchereria.

(5) ANNELIDA

True body cavity is present in these animals. The body is divided into segments and hence the name annelida. Each segment is lined one after another and contains a set of organs.

Examples: Earthworm, leech, Nereis etc.

(Q) Write the important features of phylum Nematoda

(i) Most of them are small and cylindrical: so they are called as round worms.

(ii) The body size ranges from microscopic to a few centimeter in length.

(iii) They all are mainly heterotrophic animals.

(iv) They are triploblastic (v) Body cavity has a true coelom.

(vi) Respiratory and circulatory systems are absent

(vii) They have complete alimentary canal.

(viii) Examples: Ascaris (roundworm), Enterobius, Wuchereria (filarial worm)

(Q) Enlist the main features of phylum Annelida.

(i) Body of annelids are bilaterally symmetrical.

(ii) They are triploblastic

(iii) Metameric segmentation is present

(iv) Closed circulatory system with respiratory pigment dissolved in the plasma.

(v) Nephridia for excretion and osmoregulation are present.

(vi) These animals are found in a variety of habitats like fresh water, marine water as well as on land.

(vii) Examples: Nereis (sand worm or clam worm)
Aphrodite (sea mussel), Pheretima (earthworm).

(6) ARTHROPODA

This is probably the largest group of animals. These animals are bilaterally symmetrical and segmented. There is an open circulatory system and so the blood does not flow in well defined blood vessels. The coelomic cavity is blood-filled. They have jointed legs. The word 'arthropod' means 'jointed legs'.

Examples: prawns, butterfly, housefly, spider, scorpions and crabs.

Q) Give the important distinguishing features of Arthropoda.

- (i) These animals are bilaterally symmetrical and segmented.
- (ii) Body is covered with chitinous exoskeleton.
- (iii) One or two pairs of jointed legs are present.
- (iv) The body cavity is blood-filled and is called haemocoel.
- (v) Body bears jointed appendages, and is divided into head, thorax and abdomen.
- (vi) Circulatory system is open, i.e., blood doesn't flow in blood vessels.

Examples: Palaemon, cockroach and butterfly.

<u>Annelids</u>	<u>Arthropods</u>
1) They have true body cavity called 'coelom'.	1) The body cavity is blood-filled and called 'haemocoel'.
2) Body bears lateral appendages for locomotion.	2) Jointed legs are present for locomotion.
3) They breathe through body surface.	3) They possess organs for breathing, like gills, trachea etc.
4) They do not possess chitinous exoskeleton.	4) Chitinous exoskeleton present.
5) They have closed type of circulatory system.	5) Open type of circulatory system present.

7) MOLLUSCA

The animal has soft body, which is enclosed in a hard shell. The shell is made of calcium carbonate. Circulatory system is open and kidney like organ is present for excretion. The body has well developed muscular feet for locomotion. Example: Snail, octopus, mussels.

(Q) Give the main distinguishing features of phylum Mollusca.

- (i) The animal shows bilateral symmetry.
- (ii) They have soft bodies, so they are also called soft bodied animals.
- (iii) Body is segmented and divided into head, foot and visceral mass.
- (iv) A glandular fold, the mantle, is present over the body.
- (v) There is a calcareous shell around the body in some molluscs.
- (vi) They have open circulatory system.
- (vii) Kidney-like organs for excretion are present.
- (viii) Examples: Pila, Sepia, octopus.

8) ECHINODERMATA

The body is covered with spines, which gives the name echinodermata. Body is radially symmetrical. The animals have well developed water canal system, which is used for locomotion. Skeleton is made of calcium carbonate. Ex: Starfish, sea urchin.

9) PROTOCHORDATA : Animals are bilaterally symmetrical, triploblastic and coelomate. Notochord is present at least at some stage of life. Notochord is a long rod-like structure which runs along the back of the animals. This provides attachment points for muscles. It also separates the nervous tissues from the gut. Example: Balanoglossus, Herdmania etc.

(10) VERTEBRATA

Vertebrates are the animals included in the phylum chordata in which the spinal chord is made of small vertebrae.

There are five classes of vertebrates:

- (i) Pisces (ii) Amphibian (iii) Reptiles (iv) Aves (v) Mammals

Main features:

- (i) They possess a solid notochord
- (ii) The body has bilateral symmetry
- (iii) They have a true vertebral column
- (iv) They have a dorsal hollow nerve cord.
- (v) They are triploblastic
- (vi) The terrestrial forms respire through lungs and the aquatic forms through gills.
- (vii) They are coelomate.

(1) Pisces

They are commonly known as fish. The body is streamlined. Muscular tail is present which assist in locomotion. Body is covered with scales. Paired gills are present; which can breathe oxygen dissolved in water. They are cold blooded animals. The heart has only two chambers. They lay eggs. Fishes can be bony or cartilaginous. Shark is an example of cartilaginous fish. Rohu and Katla are examples of bony fish.

The main features of Pisces are:

- (i) They are exclusively water living animals and included the fishes.
- (ii) Their skin is covered with scales/plates
- (iii) They obtain oxygen dissolved in water by using gills.

(ii) Amphibia

These animals differ from the fish in the lack of scales, in having mucous glands in the skin, and a three-chambered heart. Respiration is through either gills or lungs. They lay eggs. These animals are found both in water and on land. Frogs, toads and salamanders are examples.

(iii) Reptilia

Reptiles are the crawling vertebrates that are cold-blooded and have dry horn scales. They are mostly terrestrial and live in warmer regions. They breathe through lungs. The heart is three-chambered, except for crocodiles which have a four-chambered heart. Reptiles lay eggs with thick coverings. Examples: Snake, lizards, crocodiles, turtles etc.

(iv) Aves (Birds)

These are warm-blooded animals and have a four-chambered heart. They lay eggs. There is an outside covering of feathers, and two forelimbs are modified for flight. They breathe through lungs. All birds fall in this category.

(v) Mammalia

- (i) They are warm-blooded animals.
- (ii) Their heart is four-chambered.
- (iii) They have mammary glands which produce milk.
- (iv) They give birth to young ones, with the exception of platypus and echidna.
Kangaroos give birth to very poorly developed young ones.

Examples: cat, human, rat, whale, bat etc.

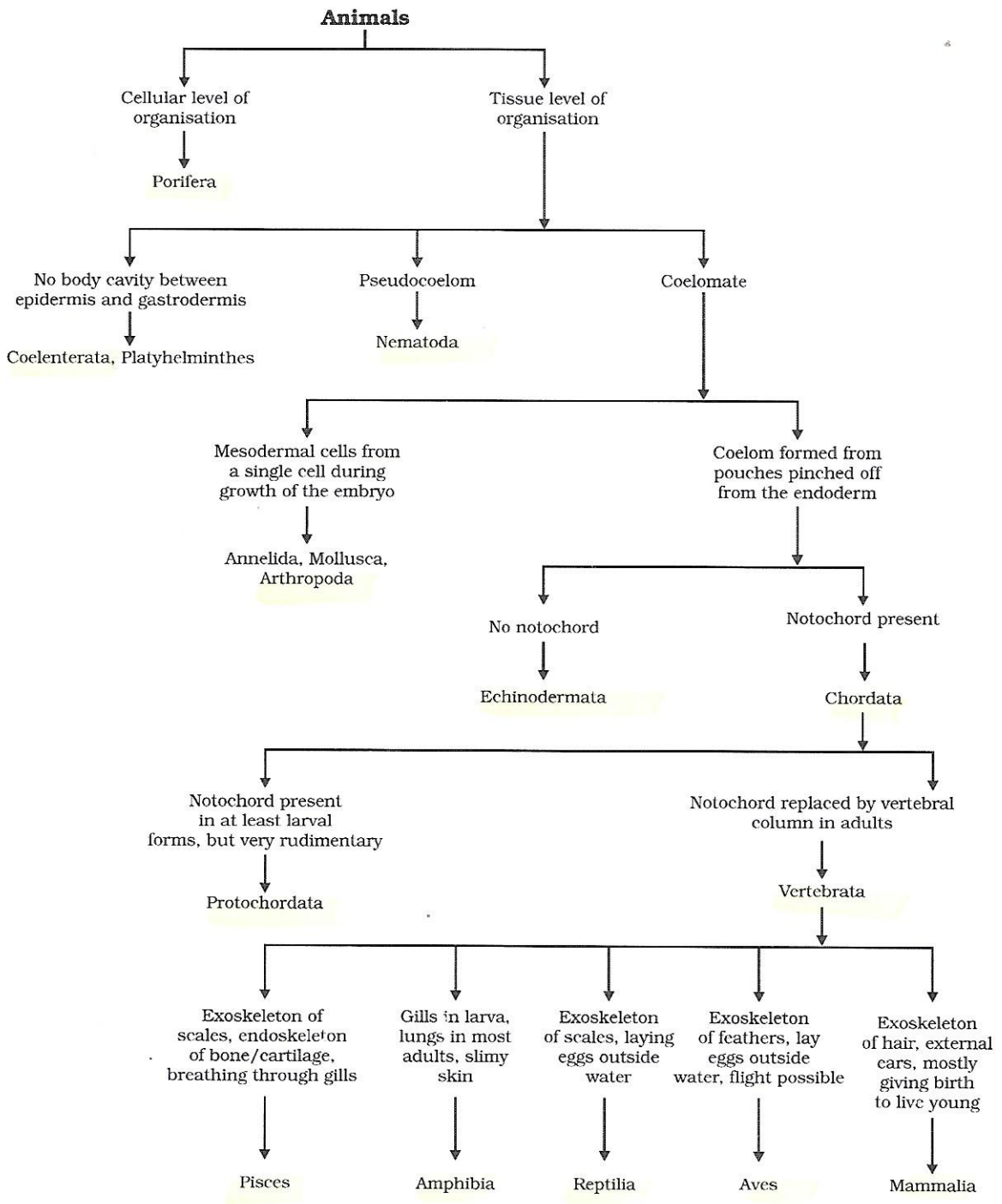


Fig. 7.26: Classification of animals

Q.1) What are the differences between amphibians and reptiles?

Amphibians	Reptiles
1) They can live both on land and in water.	1) They live either on land or in water.
2) Body is not covered with scales.	2) They have scales on their bodies.
3) Their eggs do not have any tough or hard covering around them.	3) The egg have a hard covering.
4) Their body is divided into head and trunk.	4) Body is divided into head, neck, trunk and tail.
5) They lay eggs in water and fertilization takes place in water.	5) Water is not necessary for fertilization.

Q.2) What are the differences between animals belonging to the aves group and those in the mammalian group?

Aves	Mammalia
1) Their body is covered with feathers.	1) Their body is covered with hair.
2) They have beaks.	2) They don't have beaks.
3) Anterior limbs transform into wings.	3) They don't have wings.
4) They lay eggs.	4) Most of them give birth to young ones.
5) Pinna absent.	5) Pinna present.
6) No mammary glands to feed their young ones.	6) They have mammary glands to produce milk.
7) Diaphragm is absent.	7) Diaphragm is present.

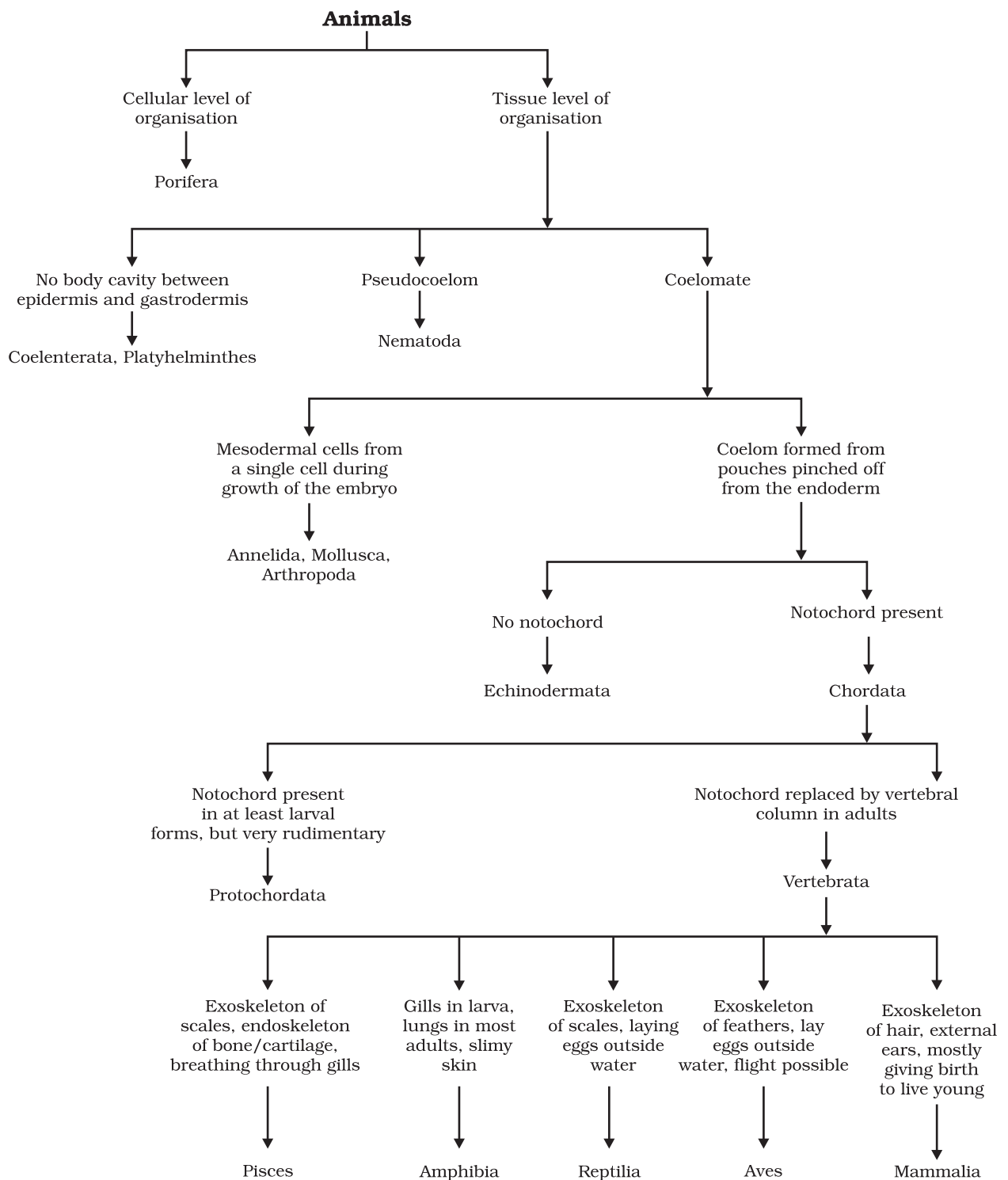


Fig. 7.26: Classification of animals