SCIENCE

KINGDOM ANIMALIA (PORIFERA)

CLASSIFICATION OF KINGDOM ANIMALIA

These organisms are EUKARYOTIC, MULTICELLULAR, HETEROTROPHIC and contains cells without cell-walls. They are further classified based on the extent and type of the body design differentiation found.

Important Terms:

Organisation: It is a structural differentiation of animal body

(i) **Cellular Organisation :** Tissues do not differentiate. Different types of cells may occur, e.g., proifera (sponges).

(ii) **Tissue Level Organisation** : Multicellular body has cells organised into tissues but organs are absent, e.g., coelenterata.

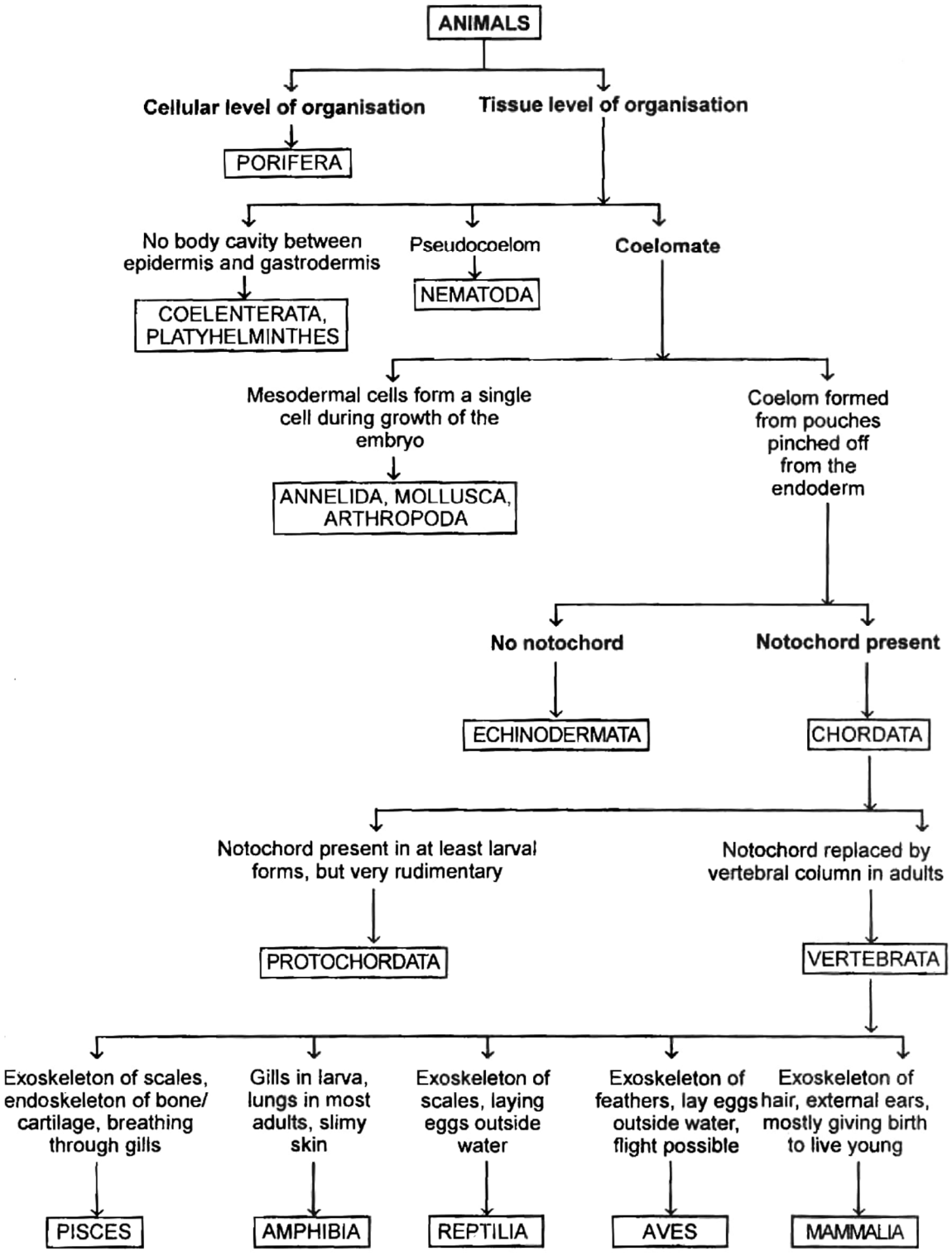
(iii) **Organs Level Organisation :** Cells are organised into tissue and organs but organ systems are absent, e.g., platyhelminthes.

(iv) **Organ System Level Organisation :** Cells are organised into tissues, tissues into organs and organs into organ systems e.g., nematoda and higher animals.

Body Symmetry: It is similarity in arrangement of parts. Absence of any repetition or similarity is called asymmetery. Symmetry is of two types, radial and bilateral.

(i) **Radial Symmetry** : The body is cylindrical or discoid where similar parts occur all around the central axis. Any vertical plane passing through the central axis will divide the body into two equal halves, e.g., many sponges, coelenterates and echinodermates. Head is generally absent.

(ii) **Bilateral Symmetry :** The body has a head. Organs and limbs are paired. They are arranged laterally. Body is divisible into two equal halves by only one plane (mid-sagittal plane). **Bilateral symmetry** is found in platyhelminthes, nematoda, annelida, mollusca, arthropoda and chordata.


ANIMALS
Cellular level of organisation
Tissue level of organisation
PORIFERA
No body cavity between epidermis and gastrodermis
Pseudocoelom
Coelomate
COELENTERATA, PLATYHELMINTHES
NEMATODA
Mesodermal cells form a single cell during growth of the embryo
Coelom formed from pouches pinched off from the endoderm
ANNELIDA, MOLLUSCA, ARTHROPODA
No notochord
Notochord present
ECHINODERMATA
CHORDATA
Notochord present in at least larval forms, but very rudimentary
Notochord replaced by vertebral column in adults
PROTOCHORDATA
VERTEBRATA
Exoskeleton of scales, endoskeleton of bone/ cartilage, breathing through gills
Gills in larva, lungs in most adults, slimy skin
Exoskeleton of scales, laying eggs outside water
Exoskeleton of feathers, lay eggs outside water, flight possible
Exoskeleton of hair, external ears, mostly giving birth to live young
PISCES
AMPHIBIA
REPTILIA
AVES
MAMMALIA

Cephalization:

It is development of head in the anterior part of the animal body.

Germ or Germinal Layers :

They are the primary layers that differentiate in the embryo.

All tissues and organs of the animal body develop from them.

Germinal layers can be two or three in number. On this basis, the animals are of two types, diploblastic and triploblastic.

(i) **Diploblastic Animals :** Animals have two germinal layers, outer ectoderm and inner endoderm. Mesoderm is absent, e.g., porifera, coelenterata.

(ii) **Triploblastic** : Animals have three germinal layers - outer ectoderm, middle mesoderm and inner endoderm, e.g. platyhelminthes of chordata.

Coelom (Body Cavity):

It is mesoderm lined fluid filled space that occurs between **alimentary** canal and **body wall** which provides shock proof environment to various body organs.

Depending upon the absence, presence and nature of coelom, animals are of three types – acoelomate, pseudocoelomate and eucoelomates.

(i) **Acoelomate :** Coelom is absent e.g., porifera, coelenterata, platyhelminthes. In platyhelminthes a mesoderm is present but it does not form a cavity.

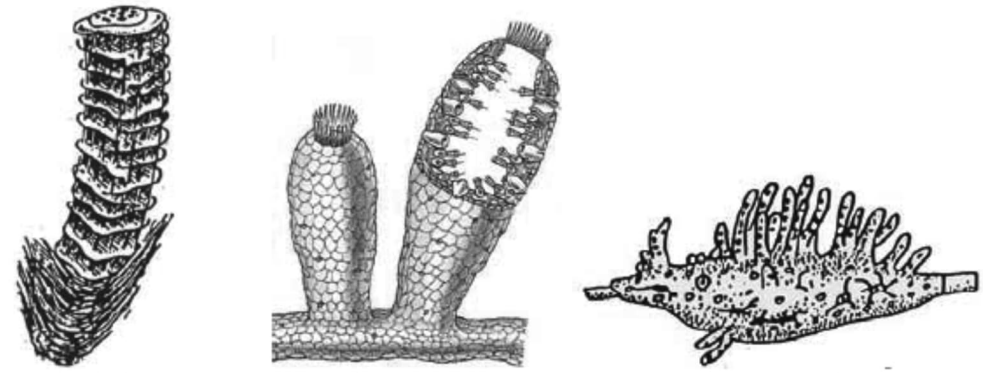
(ii) **Pseudocoelomate** : A cavity called pseudocoelom is present which is not lined by mesoderm. It is generally endodermal in origin. Mesoderm occurs but forms small seperate pouches, e.g., nematoda.

Body Temperature :

Ectotherm or Poikilotherm or cold blooded organisms can change their body temperature according to environmental temperature, ***e.g.*** Pisces, Amphibians, Reptiles.

Endotherm or Homeotherm or warm blooded organisms can not change their body temperature according to environmental temperature. **e.g.**, Aves and Mammals.

PHYLUM PORIFERA (Pores bearing animals) includes sponges.



(i) They are mostly marine but a few live in fresh water.e.g. **Spongilla**

(ii) They are **multicellular animals** with a cavity called spongocoel.

(iii) Sponges may be vase-like, rounded, sac-like or branched.

(iv) They have cellular organisation.

(v) They have porous body with innumerable pores called **ostia** and a single exhalent pore called **osculum**.

(vi) The **canal system** consists of pores, canals and chambers through which water circulates with the help of flagellate choanocytes (flagellate collar shaped cells). Water brings food and oxygen.

(vii) Skeleton is made up of **calcareous or siliceous spicules** or **spongin fibres** of either calcium carbonate or silica or spongin fibres (made up of protein). These spicules form endoskeleton.

Examples: Leucosolenia (simplest sponge), Scypha or Sycon, 'Euplectella (Venus Flower Basket), Euspongia (bath sponge), Spongilla (fresh water sponge).