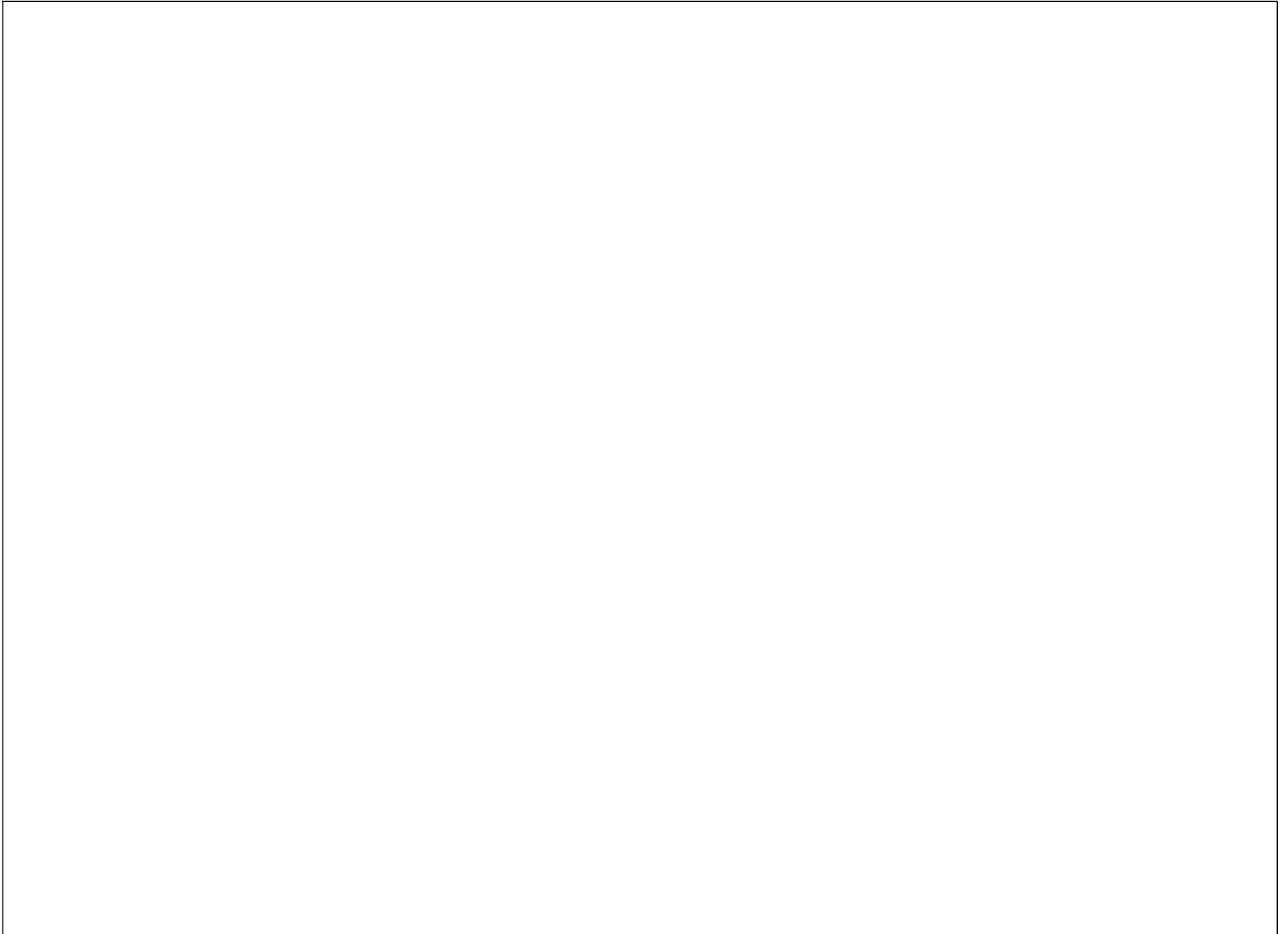


Animal Kingdom

Basis of classification

- Arrangement of cells
- Body symmetry
- Nature of coelom
- Patterns of systems





Diploblastic and Triploblastic organisation

- Ectoderm

Ectoderm forms tissues associated with outer layers: skin, hair, sweat glands, epithelium, brain and nervous system.

- Mesoderm

The mesoderm forms structures associated with movement and support: body muscles, cartilage, bone, blood, and all other connective tissues and reproductive system organs and kidneys.

- Endoderm

The endoderm forms tissues and organs associated with the digestive and respiratory systems, endocrine structures, such as the thyroid and parathyroid glands, the liver, pancreas, and gall bladder.



Metameric Segmentation

External and internal division of body into segments with a serial repetition of at least some organs

Porifera

- Asymmetrical
- Cellular level of organisation
- Presence of water canal system
- Choanocytes are present
- Calcareous spicules are present
- Hermaphrodite
- Internal fertilisation and indirect development

- Intracellular digestion

Coelenterata

- Radial symmetry
- Presence of cnidoblast
- Tissue level of organisation
- Single opening called hypostome is present
- Alternation of generation

- Digestion is extracellular and intracellular

Ctenophora

- Radial symmetry
- Diploblastic
- Tissue level of organisation
- Eight external rows of ciliated comb plates
- Extracellular and intracellular digestion
- Hermaphrodite
- Bioluminescence

- External fertilisation with indirect development

Platyhelminthes

- Endoparasites
- Dorsoventrally flattened, organ system level of organization, Bilaterally symmetrical, Triploblastic
- Acoelomate
- Cephalization starts
- Absence of locomotory organs, circulatory system
- Hermaphrodite
- Flame cells are present

- Internal fertilization with indirect development

Aschehelminthes

- Endoparasites
- Organ system level of organisation
- Triploblastic, bilaterally symmetrical, Pseudocoelomate
- Complete digestive system
- Absence of locomotory organs,
- Body wall consists of cuticle, epidermis and muscular layer
- Sexual dimorphism

- Fertilisation is internal
- Direct development

- Organ system level of organisation
- Triploblastic, coelomate, bilateral symmetry
- Metameric segmentation
- Setae or parapodia help in locomotion
- Body wall consists of cuticle, epidermis and well developed musculature
- Closed circulatory system
- Nephridia

- Paired ganglia are present
- Unisexual or bisexual
- Direct or indirect development

Arthropoda

- Organ system level, Bilaterally symmetrical
- Triploblastic
- Chitinous exoskeleton, sense organs
- Moulting or ecdysis is common
- Open circulatory system, Complete digestive system
- Jointed appendages
- Respiration takes place by trachea, book-lungs, gills etc.
- Head thorax and abdomen are three parts of body

- Malpighian tubules are present
- Paired ganglia are present
- Sexes are separate, external fertilization, oviparous, indirect development

- Organ system level
- Bilaterally symmetrical
- Triploblastic
- Calcareous shell
- Head, muscular foot and visceral hump
- Mantle cavity contains gills, secretes shell
- Complete digestive system
- Open circulatory system

- Cerebral, visceral and pedal ganglia are present
- Mouth has rasping organ called radula
- Unisexual or bisexual

- Organ system level
- Larva is bilaterally symmetrical and adult is radially symmetrical
- Triploblastic
- Pedicellariae are present on the skin
- Complete digestive system
- Water vascular system

- Sexes are separate
- Indirect development

- Organ system level of organisation
- Bilaterally symmetrical
- Triploblastic
- Coelomate
- Body is composed of proboscis, collar and trunk
- Open circulatory system
- Sexes separate
- External fertilisation

- Digestive system is complete
- Pharyngeal gill slits
- Indirect **development**



Differences between chordates and non-chordates

Chordates

- Notochord present
- Dorsal central nervous system, hollow and single
- Pharynx perforated by gill slits
- Heart is ventral
- Post anal tail is present

Non-chordates

- Notochord absent
- ventral central nervous system, solid and double
- Gill slits are absent
- Heart is dorsal if present
- Post anal tail is absent

Urochordata

- Notochord is present only in larval tail.
- Nerve cord is present in larva.
- Body is covered by thick tunic.
- Asymmetrical.
- Indirect development.
- Gill slits are found.

- Retrogressive metamorphism

Cephalochordata

- Notochord is persistent throughout life.
- Tunic is absent.
- Gill slits are present.
- Protonephridia for excretion
- Closed circulatory system
- Unisexual

- Indirect development
- Progressive metamorphosis

Cyclostomata

- 6-15 pairs of gill slits
- Sucking and circular mouth without jaws.
- Scales and paired fins absent
- Cartilaginous skeleton
- Fins are unpaired
- Two chambered heart

- External fertilisation
- They are marine but migrate to fresh water for laying eggs

Chondrichthyes

- Marine
- Mouth is ventral
- Notochord is persistent
- Open gill slits
- Placoid scales are present
- Teeth are modified placoid scales
- Two chambered heart
- Air bladder is absent

- Cartilaginous skeleton
- Sexes separate and internal fertilisation
- Viviparous

Osteichthyes

- Bony skeleton
- Mouth terminal
- Four pairs of gills covered by operculum
- Cycloid or ctenoid scales
- Air bladder is present
- Heart two chambered
- Sexes separate

- External fertilisation and oviparous
- Development is direct

Amphibia

- Two pairs of limbs
- Body is divisible into head and trunk
- Skin is moist and without scales
- The eyes have eyelids.
- A tympanum is present.
- Alimentary canal, urinary and reproductive tracts open into a common chamber called cloaca.
- Respiration is by gills, lungs and through skin.

- Heart is three chambered.
- Cold blooded.
- Sexes are separate, external fertilisation and indirect development.

Reptilia

- Body is covered by scales.
- Tympanum represents ear.
- Two pairs of limbs(if present).
- Heart is three chambered except crocodile
- Sexes are separate and internal fertilization.

- Oviparous and direct development.

Aves

- Presence of feathers and beak
- Forelimbs are modified into wings
- Skin is dry without glands except the oil gland at the base of the tail.
- Pneumatic bones are present.
- Additional chambers, present in digestive tract are crop and gizzard.
- Heart is four chambered

- Warm blooded animals
- Fertilization is internal, oviparous and development is direct.
- Respiration is lungs.

Mammalia

- Presence of mammary glands
- Two pairs of limbs
- Presence of hair
- External ear or pinna is present
- Heart is four chambered
- Respiration is by lungs

- Viviparous