

Animal Kingdom



Ladybird Beetle.



Basis Of Classification

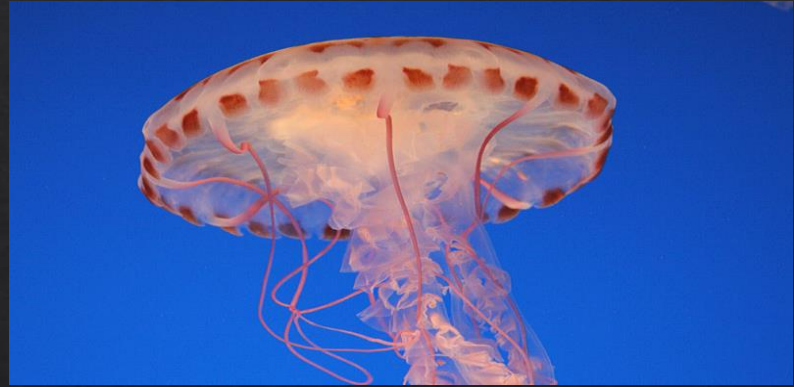
- ◇ Arrangement of cells(Cellular or Tissue or Organ level)
- ◇ Body Symmetry(Asymmetrical or Radial or Bilateral)
- ◇ Nature of coelom(Acoelomates or Coelomates or Pseudocoelomates)
- ◇ Pattern of digestive, circulatory or reproductive systems(Open or closed)

Symmetry

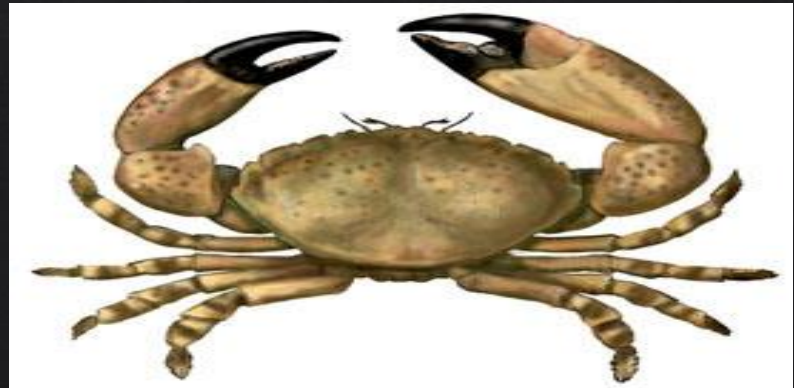
◇ Asymmetry-



◇ Radial Symmetry-

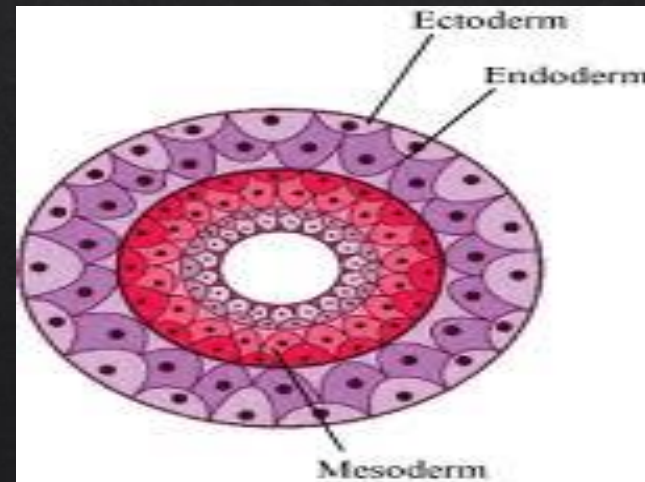
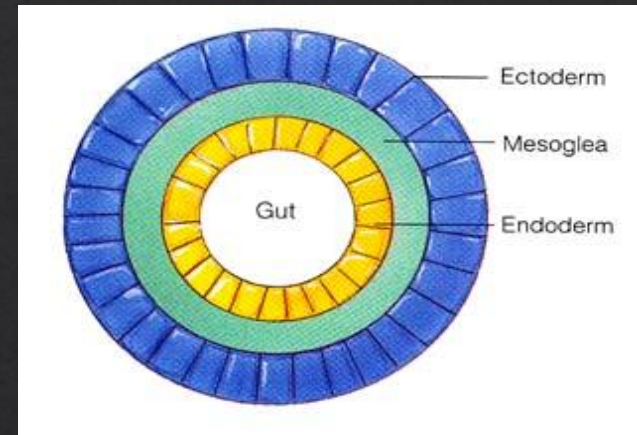


◇ Bilateral Symmetry-



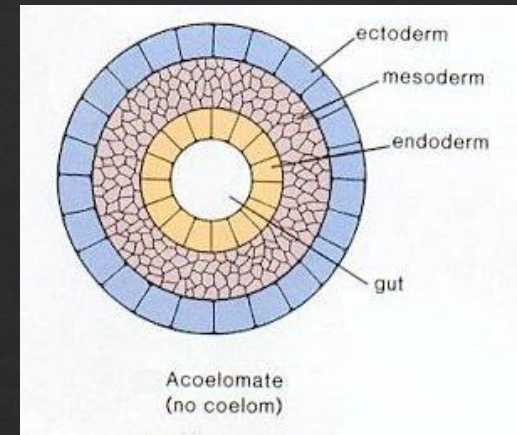
Diploblastic and Triploblastic

- ◆ Cells are arranged in two germ layers i.e. external ectoderm and internal endoderm.
- Cells are arranged in three germ layers i.e. mesoderm in between ectoderm and endoderm.

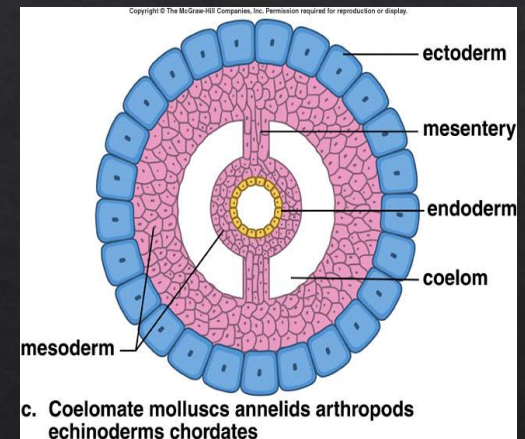


Coelom

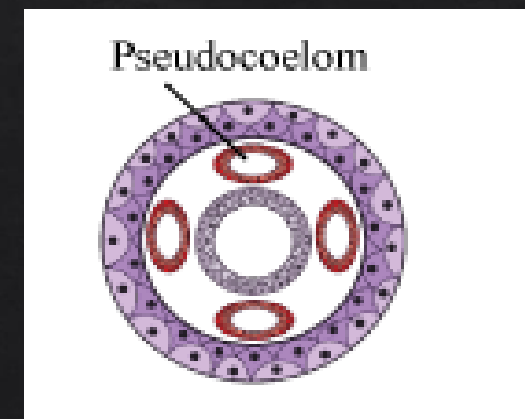
◇ Acoelomates (Platyhelminthes)



◇ Coelomates (Annelida, Arthropoda, Mollusca, Echinodermata, Hemichordata, Chordata)

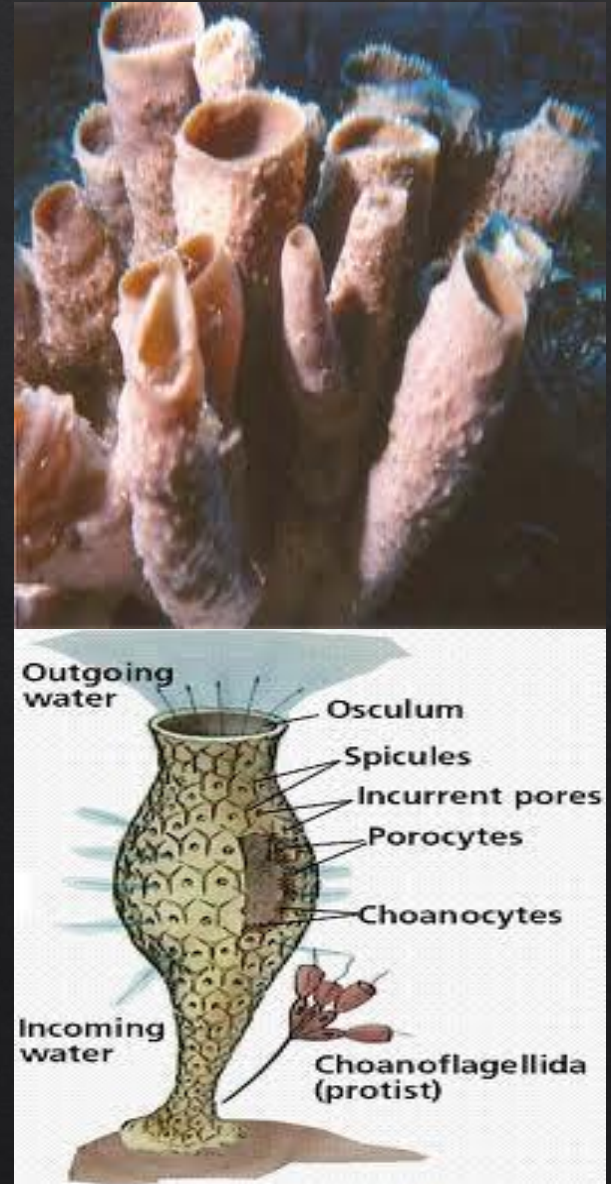


◇ Pseudocoelomates (Aschelminthes)



Phylum Porifera (Sponges)

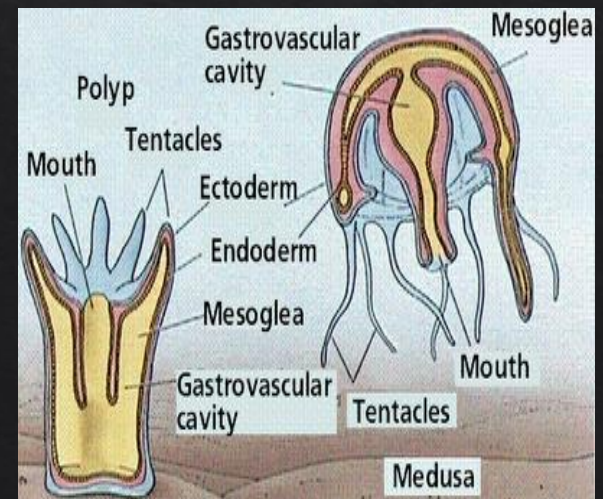
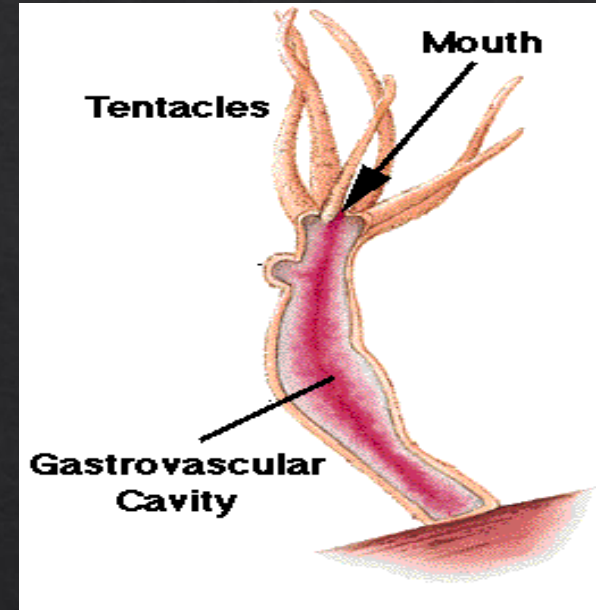
- Cellular level of Organization.
- Asymmetrical
- Water canal system. Water enters through Ostia ,then into spongocoel from where it goes out through the osculum.
- Presence of Choanocytes or collar cells line the spongocoel.
- Presence of spicules
- Hermaphrodite (Sexes not separate)
- Fertilization is internal.
- Development is indirect.
- Habitat is marine.
- Examples: *Sycon* , *Spongilla*



Phylum Coelenterata (Cnidaria)

- ◇ They are aquatic, mostly marine, sessile
- ◇ Radial symmetry
- ◇ Presence of cnidoblasts
- ◇ Tissue level organization.
- ◇ Diploblastic.
- ◇ Gastrovascular cavity.
- ◇ They have two different body plans:
 - 1). Polyp (sessile, reproduce by budding)
 - 2). Medusa (motile, sexual reproduction)
- ◇ Shows the property of metagenesis.
- ◇ Examples: -*Hydra*, *Jellyfish*,

Sea anemone



Phylum Ctenophora

- ◊ Habitat Marine
- ◊ Radially symmetry
- ◊ Diploblastic
- ◊ Tissue level organization.
- ◊ Have eight rows of ciliated comb plates.
- ◊ Shows property of Bioluminescence.
- ◊ Hermaphrodite.
- ◊ Fertilization external
- ◊ Development indirect.
- ◊ Examples- *Pleurobranchia*,

Ctenophora



Phylum Platyhelminthes

- ◇ They are known as flatworms. (dorsoventrally flattened)
- ◇ Bilateral symmetry.
- ◇ Many flatworm are parasites (ex: tape worm and flukes), while some of them (ex: planarian) are free living in the aquatic or damp soil habitat.
- ◇ Acoelomates
- ◇ Organ level Organization.
- ◇ Presence of Flame cells for Osmoregulation and excretion.
- ◇ Triploblastic.
- ◇ Hermaphrodite.
- ◇ Fertilization is internal.
- ◇ Indirect development.



Phylum Aschelminthes(Nematoda)

- ◇ Known as a round worm it has a cylindrical body.
- ◇ Digestive system that is like a tube, open at both ends (starts from mouth and ends in anus), Alimentary canal complete
- ◇ Mostly free living, aquatic and terrestrial or parasitic.
- ◇ Bilateral symmetry
- ◇ Triploblastic
- ◇ Pseudocoelomate
- ◇ Sexes separate(dioecious)
- ◇ Fertilization internal.
- ◇ Development direct or indirect
- ◇ Examples- *Ascaris lumbricoides* and hook worms)



Phylum Annelida

- ◇ Habitat aquatic and terrestrial.
- ◇ Organ level body organization.
- ◇ Segmented worms(metamerism).
- ◇ Possess lateral appendages(parapodia).
- ◇ Closed circulatory system.
- ◇ Nephridia helps in osmoregulation and excretion.
- ◇ Earth worms and leeches are included in this phylum.
- ◇ Hermaphrodites (Earthworms and Leeches),
Dioecious(*Nereis*).



Phylum Arthropoda

- ◇ Largest phylum.
- ◇ Organ level of organization.
- ◇ Bilaterally symmetrical
- ◇ Triploblastic
- ◇ Segmented body and Coelomate animals.
- ◇ Made of chitinous exoskeleton
- ◇ Body consists of head, thorax and abdomen
- ◇ Jointed appendages.
- ◇ Respiratory organs(gills, book lungs or tracheal system)
- ◇ Circulatory system is open type.
- ◇ Excretion through malphigian tubules.
- ◇ Sexes are separate.



Phylum Mollusca

- ◇ Second largest phylum.
- ◇ Soft bodies that are often protected by a hard outer shell.
- ◇ Habitat terrestrial or aquatic.
- ◇ Organ level organization.
- ◇ Bilaterally symmetrical, Triploblastic and Coelomate.
- ◇ Body is unsegmented with distinct head, muscular foot and visceral hump.
- ◇ A mollusk has a thin layer of tissue called a mantle that covers its internal organs.
- ◇ Mouth with radula.



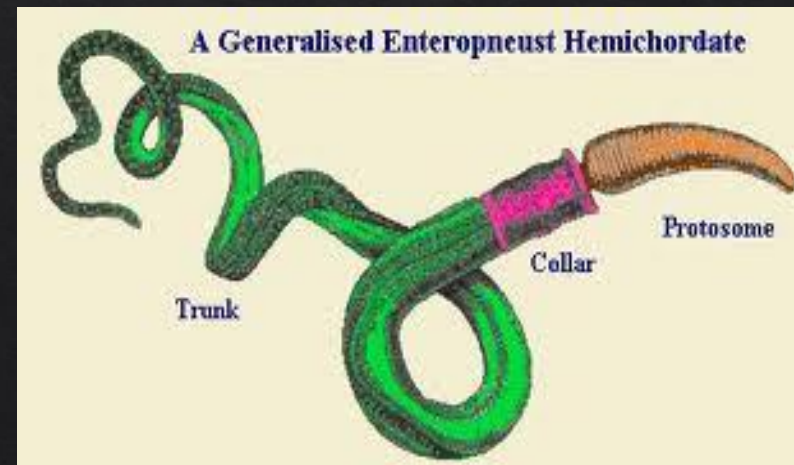
Phylum Echinodermata

- ◇ Have endoskeleton of calcareous ossicles(Spiny body)
- ◇ Radial symmetry(Adults)
- ◇ Bilateral symmetry(Larvae)
- ◇ Triploblastic, Coelomate
- ◇ Digestive system complete
- ◇ Presence of water vascular system
- ◇ Excretory system absent
- ◇ Sexes separate
- ◇ Fertilization external
- ◇ Examples: Star fish, Sea Urchin, Sea cucumber



Phylum Hemichordata

- ❖ Consists of worm-like marine animals
- ❖ Organ-system level of organization
- ❖ Bilateral Symmetry
- ❖ Triploblastic and Coelomate
- ❖ Body is cylindrical and is composed of proboscis, a collar and a long trunk
- ❖ Open Circulatory system
- ❖ Respiration through gills
- ❖ Sexes separate
- ❖ Fertilization external
- ❖ Development is indirect
- ❖ Examples: *Balanoglossus*, *Herdmania*



Phylum Chordata

- Presence of notochord
- Central nervous system is dorsal
- Pharynx perforated by gill slits
- Heart is ventral
- Post anal tail present
- Is divided into three subphyla:
 - Urochordata- Notochord is present only in larval tail.
 - Cephalochordata- Notochord extends from head to tail region throughout their life.
 - Vertebrata- Presence of Notochord during embryonic period, replaced by vertebral column



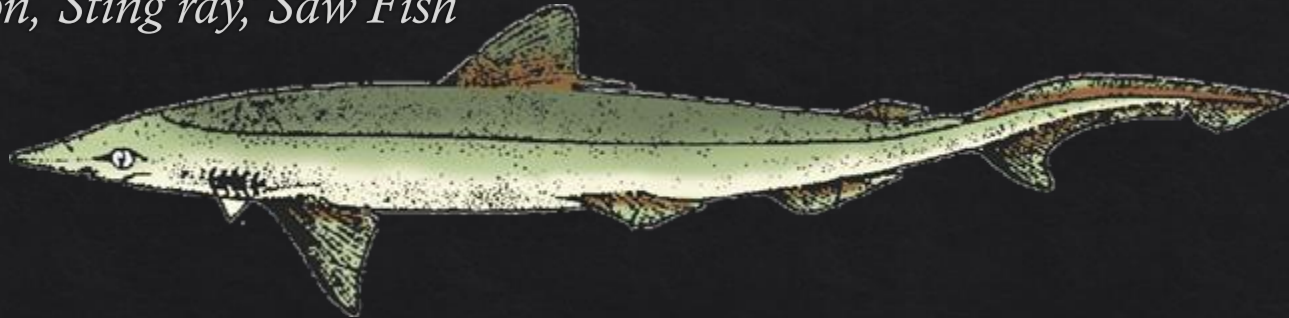
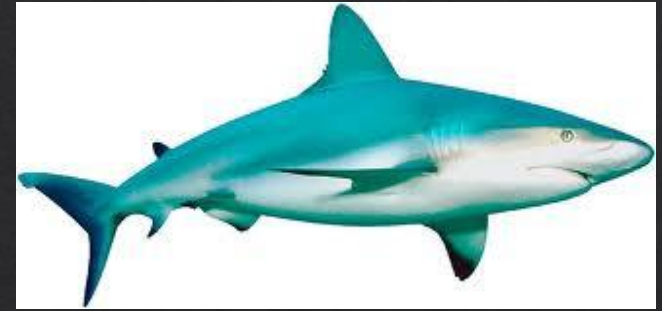
Class Cyclostomata

- ◇ Ectoparasites
- ◇ Elongated body bearing gill slits for respiration
- ◇ Mouth without jaws
- ◇ Body is devoid of scales, paired fins
- ◇ Closed circulatory system
- ◇ Habitat marine migrate to fresh water(during spawning)
- ◇ Exapmles: *Petromyzon*, *Hagfish*



Class Chondrichthyes

- ◇ Cartilaginous fishes
- ◇ Mouth is located ventrally
- ◇ Gill slits separate without operculum
- ◇ Presence of placoid scales
- ◇ Air bladder absent
- ◇ Two chambered heart
- ◇ Poikilothermous(cold blooded animals)
- ◇ Sexes are separate
- ◇ Fertilization internal
- ◇ Viviparous
- ◇ Examples: *Scoliodon*, *Sting ray*, *Saw Fish*



Class Osteichthyes

- ◇ Bony endoskeleton
- ◇ Body is streamlined
- ◇ Mouth is mostly terminal
- ◇ Gills covered with operculum
- ◇ Presence of cycloid scales
- ◇ Presence of Air bladder
- ◇ Heart is two chambered
- ◇ Cold blooded
- ◇ Fertilization is external
- ◇ Oviparous
- ◇ Examples: *Sea horse, Rohu, Katla*



Class Amphibia

- ◇ Dual Habitat
- ◇ Body divided into head and trunk.
- ◇ Skin without scales
- ◇ A tympanum represents the ear
- ◇ Alimentary canal, Urinary and reproductive tracts open into a common chamber called Cloaca.
- ◇ Respiration by gills, lungs and through skin.
- ◇ Heart is three chambered
- ◇ Cold blooded
- ◇ Sexes separate
- ◇ Oviparous
- ◇ Examples: *Frog, Salamander, Toad, Hyla*



Class Aves

- ◇ Presence of Feathers, possess beak
- ◇ Forelimbs modified into wings
- ◇ Skin is dry, without glands(except oil glands)
- ◇ Endoskeleton is bony, Hollow bones
- ◇ Warm blooded
- ◇ Fertilization internal
- ◇ Oviparous
- ◇ Examples: Pigeon , Ostrich, Crow, Peacock



Class Mammalia

- ◊ Presence of Mammary glands
- ◊ Skin covered with hair.
- ◊ Heart is four chambered
- ◊ Warm blooded
- ◊ Respiration by lungs
- ◊ Sexes separate, Fertilization internal
- ◊ Oviparous(*Platypus*),
Viviparous(Kangaroo, Humans, Bears)



**Presented By –
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