BSc. Biological Science

Lecture-4

Phylum Coelenterata

By Dr. Dharam Singh

Phylum Coelenterata contains a wide variety of aquatic (marine and freshwater) animals, about 9000 species of coelenterates are present on earth planet. The most of coelenterates are capable of some form of movement, ranging from creeping on a pedal disc and burrowing to freely swimming. They are found from the deepest reaches of the ocean to the intertidal zone, and in some habitats they are one of the dominant animals. They include the jellyfish, sea anemones, hydroids, soft and stony corals. Coelenterates are multicellular organisms and can be found living in groups. The body wall of these animals possesses epithelial cells, muscle cells, glandular cells, nerve cells and nematocyst cells. These nematocys cells present in the body wall will help in paralyzing the prey while collecting food.

Coelenterates have a holozoic form of nutrition. The mouths of these organisms are encircled with tentacles which have nematocysts. There is no presence of an anus in these organisms; the mouth is responsible for both ingestion and elimination. Coelenterates have tentacles that help them capture their prey, eat and digest it. These tentacles are also used for defence purposes. Coelenterates are show radial and biradial symmetrical body. Most coelenterates are radially symmetrical consisting of a central gastrovascular cavity. This gastrovascular cavity consists of only one opening i.e. mouth present on the hypostome. The anus is absent. The coelenterates show polymorphism as their zooids shows two forms i.e. polyp & medusa. The polyps are sessile & asexual zooids while the medusae are free living & sexual forms. They are carnivorous ,without anus, respiratory ,circulatory & exceretary system. Life cycle shows alternation of generation as the asexual polypoid gen. is alternated with the sexual medusoid generation.

The phylum coelenterata (Cnidaria) is divided into three classes: Hydrozoa (hydra and obelia), Scyphozoa (jellyfish) and Anthozoa (sea anemones and corals), but the Cubozoa (Cubomedusae, sea-wasps) are sometimes separated from the Scyphozoa to form a fourth class.

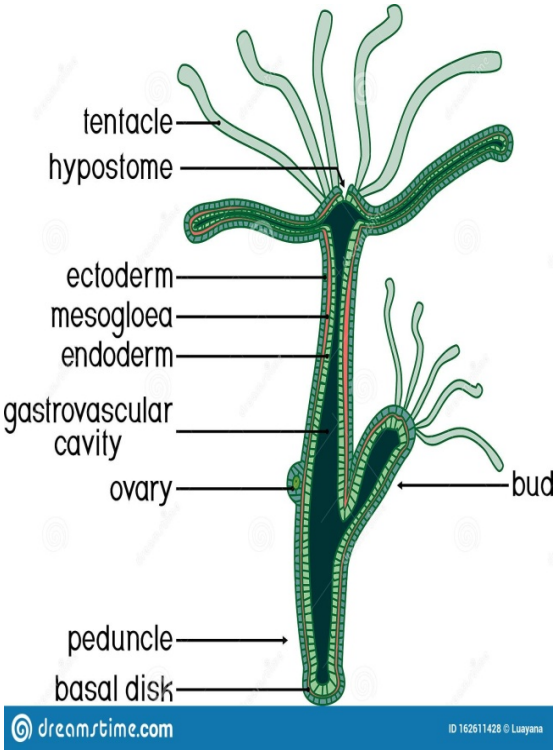
Classification of hydra

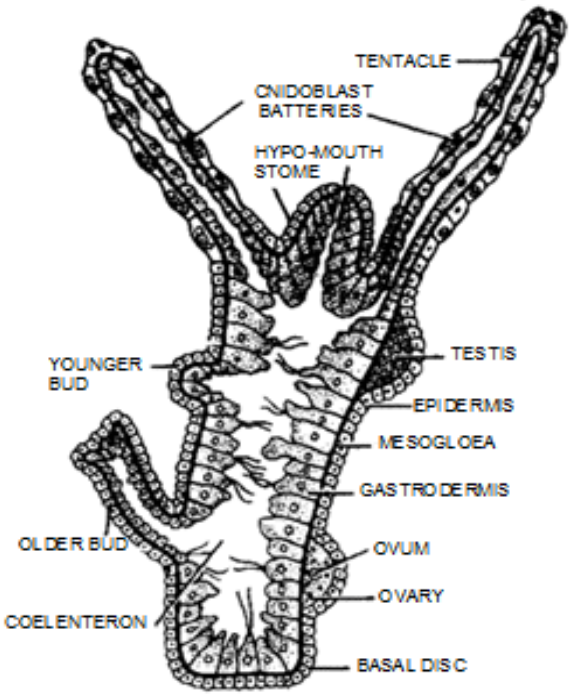
Phylum	Coelenterata
Class	Hydrozoa
Order	Hydroida
Suborder	Anthomedusae
Genus	Hydra
Species	*vulgaris*

Hydra is solitary sessile freshwater animals which occurs in lakes, ponds, streams and seasonal ditches, where weeds and other vegetation are commonly present. They may be found attached to and hanging downwards from underside of solid objects in water such as leaves, sticks, stone, weeds etc. Hydra is a polypoid coelenterate with a tubular or cylindrical body, it is a multicellular, diploblastic animals. Hydra has a great power of regeneration ability replace its damage body parts. The external morphology of hydra is consist of hypostome, mouth and tentacles, pedal disc and gonads. The hydra show movements of the following types are: 1) Expansion and contraction, 2) Looping, 3) Somersaulting, 4) Gliding , 5) Walking , 6) Climbing, 7) Floating, 8) Surfacing, 9) Swimming.

The hydra is a diploblastic animal which body wall is divided in ectoderm and endoderm germ layers. These germ layers form two distinct cellular layers such as outer epidermis and inner gastrodermis. The epidermis of hydra is composed of small, more or less cuboidal cells, which is protective and sensory layer. The various epidermal cells are following type:1).Epithelio muscle cells, 2) Gland cell, 3) Interstitial cells, 4) Cnidoblast, 5) Sensory cells, 6) Nerve cells, 7)Germ cells

The gastrodermis are hollow and bag-like gastro vascular cavity. it is constitutes nearly two-third of ontirior thickness of body wall. It is chiefly formed typical columnar cells, this layer is mainly nutritive in function, they are following types: 1) Endothelio-muscle or nutritive muscle, 2)Endothelio gland cell,3)Interstitial cells, 4) Sensory cells , 5) Nerve cells.

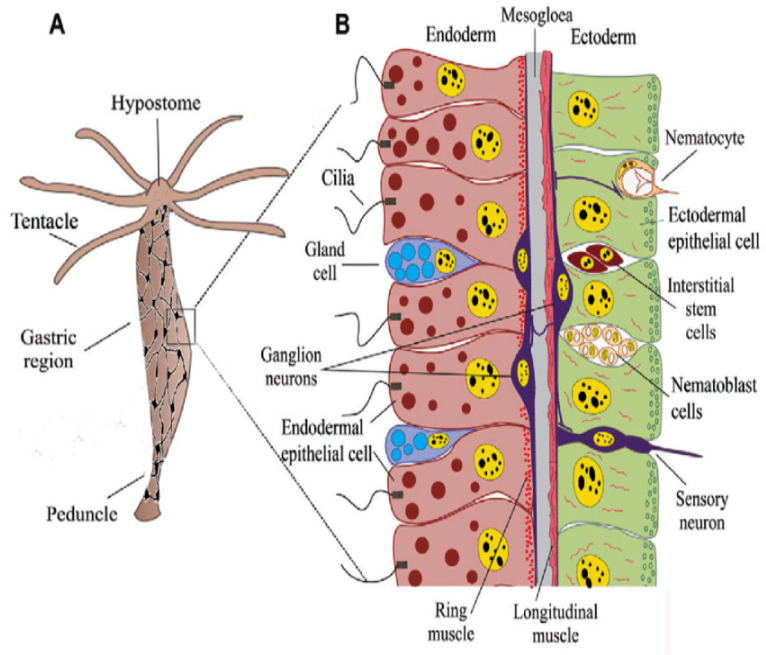




L.S Section of Hydra

Mesogloea of hydra is a non-cellular thin layer which is sandwiched between epidermis and gastrodermis. It is consist of proteinaceous matrix devoid of cellular elements. This layer is thickest in pedal disc and gradually thin towards the tentacular ends.

Hydra reproduces asexual reproduction by budding and sexually by formation of gametes.



Hydra: A position of body wall in longitudinal section

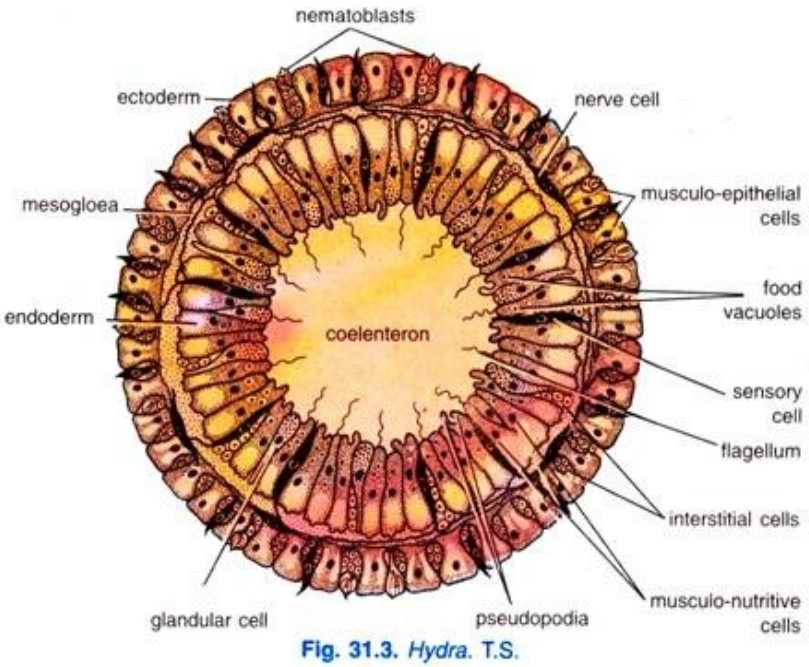
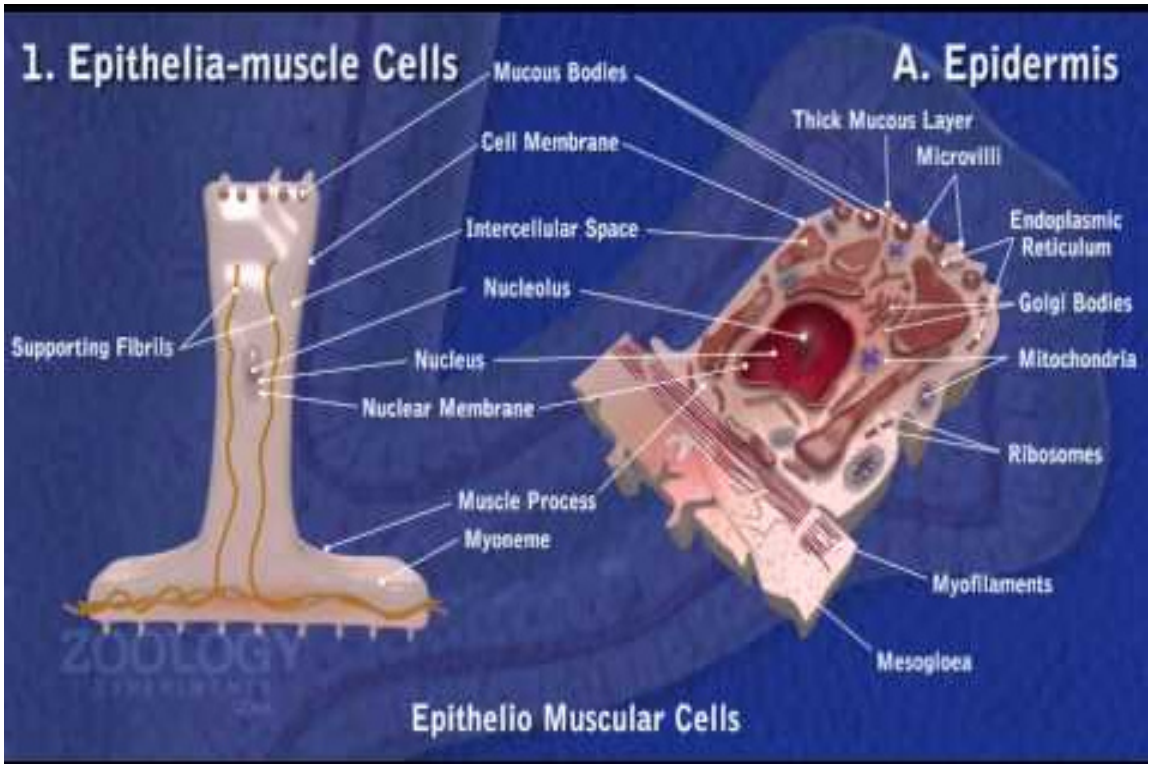
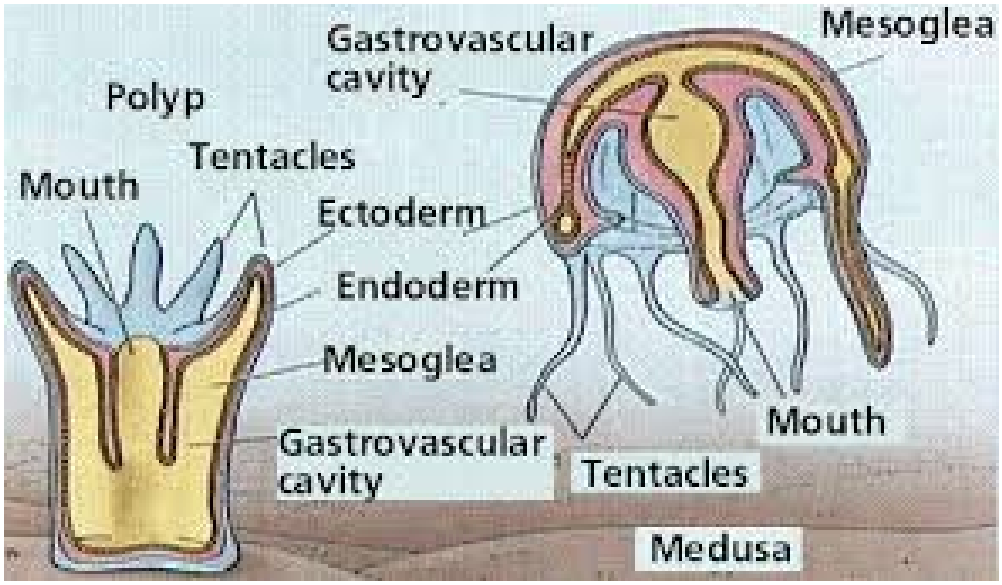
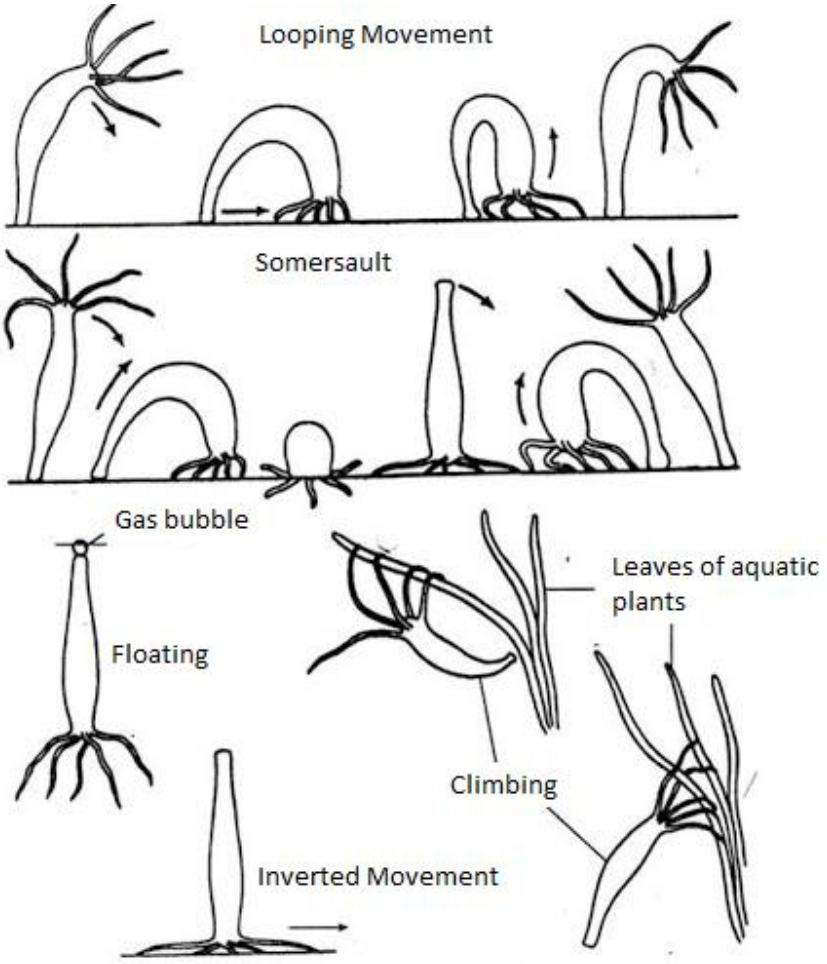


Fig. 31.3. *Hydra*. T.S.

Hydra: Transverse section


1. Epithelia-muscle Cells
A. Epidermis
Mucous Bodies
Cell Membrane
Intercellular Space
Nucleolus
Supporting Fibrils
Nucleus
Nuclear Membrane
Muscle Process
Myoneme
Thick Mucous Layer
Microvilli
Endoplasmic Reticulum
Golgi Bodies
Mitochondria
Ribosomes
Myofilaments
Mesogloea
Epithelio Muscular Cells


Polyp
Mouth
Tentacles
Gastrovascular cavity
Ectoderm
Endoderm
Mesoglea
Gastrovascular cavity
Mesoglea
Mouth
Tentacles
Medusa



Locomotion of Hydra