TOPIC: ANIMAL KINGDOM PART-II:PHYLUMS:COELENTERATA & CTENOPHORA

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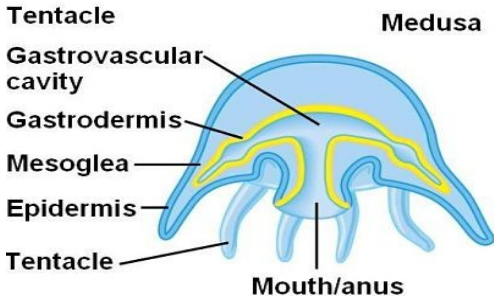
Phylum Cnidaria (or Coelenterata)

(i) 'Tissue grade' eumetazoans with a radial symmetry.

(ii) The term "Coelenterata" signifies the presence of a single internal cavity called coelenteron, or gastrovascular cavity, combining functions of both digestive and body cavities. The term "Cnidaria" indicates the presence of stinging cells (Gr., *knide* = nittle or stinging cells).

(iii) Phylum coelenterata has the following salient features –



- Coelenterates are multicellular organisms
- They have tissue-grade of organization
- The body is radially symmetrical. Radial symmetry is the symmetry of a wheel

- All the members of this phylum are aquatic
- They are solitary or colonial
- Polyps and medusa occur in the life cycle.
- The body wall is diploblastic.
- Nematocysts or stinging cells are present.
- Coelom is absent; hence coelenterates are acoelomate animals
- A gastrovascular cavity or coelenteron is present.
- Mouth is present; but anus is absent
- Digestion is extracellular as well as intracellular
- Respiratory, excretory and circulatory system are absent
- Nervous system is diffuse-type, formed or nerve-nets.
- Reproduction is by asexual and sexual methods
- Development is indirect as there are one or two larval forms
- Life history has alternation of generations or metagenesis.

Classification of coelenterate

Class 1 - Hydrozoa

- Hydrozoa is solitary and fresh water or mostly colonial and marine.
- They exhibit tetramerous or polymerous radial symmetry
- Body wall consists of an outer ectoderm and an inner endoderm separated by a mesogloea.
- Gastrovascular cavity without stomodaeum, septa or nematocysts bearing gastric filament
- Skeleton or horny structure is horny perisarc in some forms.
- They exhibit polymorphism.
- Many hydrozoa exhibit alternation of generation

- Reproductive products of sex cells are usually ectodermal in origin and discharged externally.
- Cleavage is holoblastic, embryo ciliated planula.
- Examples : Hydra, Tubularia, Bougainvillea, Hydractinia, Eudendrium, Pennaria, Obelia, Sertularia, Plumularia
- Physalia is commonly known as Portuguese man of war. Aurelia is commonly known as Jellyfish.

Class 2 - Scyphozoa

- Scyphhozoa includes large jellyfishes or true medusae.
- They are exclusively marine.
- Medusae are large, bell or umbrella-shaped and without true velum.
- Marginal sense organs are tentaculocysts
- Polypoid generation is absent or represented by small polyp.
- Gastrovascular system is without stomodaeum, with gastric filaments.
- Mesogloea is usually cellular
- Gonads are endodermal and the sex cells are discharged into the stomach.
- Examples: Lucernaria, Haliclytus

Class 3 - Anthozoa

- These are solitary or colonial exclusively marine forms
- They are exclusively polypoid. Medusoid stage is altogether absent
- Body is cylindrical with hexamerous, octomerous or polymerous biradial or radiobilateral symmetry
- The stomodaeum is often provided with one or more ciliated grooves, the siphonoglyphs.

- Gastrovascular cavity is divided into compartments by complete or incomplete septa or mesenteries.
- Mesenteries bear nematocysts at their free edges
- Mesogloea contains fibrous connective tissue and amoeboid cells.

Subclass 1 - Alcyonaria (Octocorallia)

- These are colonial marine forms
- Polyps are long or short cylinders
- Polyps always bear eight pinnate, hollow tentacles
- Eight complete mesenteries are present.
- Single ventral siphonoglyph is present
- Endoskeleton is the product of mesogloeal cells
- Polyps are dimorphic in some forms.
- Examples: Tubipora, Calvularia, Alcyonium, Xenia, Heliopora, Gorgonia, Corallium, etc.,
- Tubipora is commonly known as organ pipe coral.

Subclass 2 - Zoantharia (Hexacorallia)

- These are solitary or colonial marine forms
- Tentacles simple, rarely branched, hollow cone shaped
- Mesenteries are numerous arranged in the multiple of five or six
- Two siphonoglyphs are commonly present
- Endoskeleton when present is calcareous, derived from ectoderm
- Polyps are usually monomorphic.
- Examples: Actinia, Metridium, Adamsia, Edwardsia, Astraea, Fungia, Zoanthus, Antipathes
- Metridium & Adamsia is commonly known as sea anemone.

Phylum Ctenophora

Ctenophora is a small phylum. These animals exhibit the characters of Coelenterata and platyhelminthes.

Phylum Ctenophora shows the following salient features

- All the ctenophores are marine.
- They are solitary and pelagic.
- They are transparent.
- They have tissue-grade of organization.
- They have biradial symmetry.
- They are acoelomate animals.
- They are non-segmented.
- Their body-wall is diploblastic.
- The mesogloea contains cells.
- Nematocysts are absent.
- Special adhesive cells called colloblasts are present in all ctenophores.
- The gastrovascular system is well developed.
- Two anal openings are present.

- Skeletal system is absent.
- Excretion and respiration are carried out by diffusion.
- The nervous system is in the form of nerve net.
- An aboral sense organ in present in the form of statocyst.
- Cilia are used for locomation.
- They are hermaphrodites.
- Development is indirect. It includes a cydippid larva.

Classification of Ctenophora

Class 1 - Tentaculata

- The body is simple, rounded or oval or ribbon-like.
- Two long aboral tentacles are present.
- Mouth is narrow and pharynx is small.

Order 1 - Cydippida

- Body is oval or rounded
- Two long branched tentacles are present and they can be retracted into sheaths
- Branches of gastro–vascular system are terminating blindly
- Examples: Hormiphora, Pleurobrachila, etc.

Order 2 - Lobata

- Body is laterally compressed
- Two large oral lobes or lappets and four pointed processes or auricles are present
- Tentacles are many, non–retractile without sheaths.
- Stomodaeal and meridional vessels unite with one another
- Examples: Deiopea, Bolinopsis, etc.

Order 3 - Cestida

- Body is laterally compressed and ribbon-like
- Two main tentacles and may lateral tentacles are present
- Four rows of rudimentary comb plates are present
- Meridonal and stomodaeal vessels anastomose
- Examples: Cestum, Velamen, etc.

Order 4 - Platyctenea

- Body is worm-like and compressed in oral-aboral axis
- Tentacles with sheaths are present
- Comb rows or swimming plates are present only in larva
- Meridional canals are absent, but there is a system of branching peripheral system

Class 2 - Nuda

- Body is large thimble-shaped or conical
- Tentacles are absent
- Mouth is wide and pharynx is large
- The meridional vessels are produced into a complex system of anastomosing branches
- Example: Beroe

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