PHYLUM : MOLLUSCA
GENERAL CHARACTERS :

- Soft bodied triploblastic, bilaterally symmetrical, unsegmented schizocoelomates are - Molluscs
- True coelomate unsegmented soft bodied animals - Mollusca
- Study of mollusca - Malacology
- Second largest phylum - Mollusca
- Study of Molluscan shells - Choncology
- Jhonson created the name Mollusca for - Cephalopods and barnacles
- The classification which was revised and first to include modern views was published by Cuvier
- Molluscan shells show variation in - Size, shape, colour and architecture
- Mollusca are mostly marine.
- Some gastropods and bivalves live in - fresh-water.
- Some gastropods are terrestrial
- Cultured pearls are produced by Pinctada vulgaris (source of foreign exchange earning)
- Molluscs are Triploblastic animals
- Normal divisions of body in Mollusca - anterior head, dorsal visceral mass & ventral foot
- Fold of skin enclosing the soft body - Mantle or pallium
- Space between mantle and visceral mass is called - mantle cavity or pallial cavity
- Mantle cavity contains gills, ospharidium, anus, nephridiopores, and gonopores.
- Coelom is reduced and the primary body cavity is haemocoel, composed of several large sinuses of the open blood vascular system.
- True coelom in mollusca is restricted organs - Pericardial cavity, gonads and kidney
- A secretory product of Mantle is - Shell
- Outer most layer of the shell is composed of a protein called - Conchiolin
- The inner two layers of the shell are composed of calcium carbonate.
- Chief organ of Locomotion in Mollusca is - Muscular foot
- Foot less mollousca - Aplacophora, oysters
- Symmetry in Mollusca - Bilateral
- Asymmetry in Gastropoda is due to - Torsion
- Shell less molluscs - Aplacophora, Octopus, slugs
- Molluscs with internal shell - Sepia, Loligo, Aplysia
- Rasping organ (or) Masticatory organs - Radula
- Molluscs without Radula - Pelecypoda or Bivalvia
- Molluscs with a crystalline style secreting amylase in the stomach - Pelecypoda or Bivalvia and some gastropods
- The cavity into which digestive, excretory and reproductive systems open in Mollusca - Mantle cavity
- Respiratory organ in aquatic molluscs - Ctenidia
- Respiration in Terrestrial forms - Pulmonary sac formed by mantle
- Circulatory system in molluscs - Open type except Caphalopoda
- Chambers in the Heart - One pair of atria and one ventricle
- Heart is systematic heart - atria receive oxygenated blood from the gills and ventricle pumps blood to haemocoelomic sinuses through blood vessels.
- Blood pigment in molluscs - Copper containing bluish Haemocyanin
- Excretory organs - Metanephridia or Kidneys
• Kidneys of Mollusca open into pericardial cavity through - nephrostome
• They open into exhalent chamber of mantle cavity through - nephridiopores
• Peculiarity of nervous system in mollusca - several pairs of ganglia connected by commisures and connectives
• A nerve joining similar ganglia - commisure
• A nerve joining dissimilar ganglia connective
• Receptors in mollusca -
  • eyes (photoreceptors)
  • tentacles (tangoreceptors)
  • osphradium helps in testing quality of water and amount of sediment in water.
  • statocyst (balancing organ)
• Sexuality in mollusca - majority are unisexual
• Most common larva - trochophore
• In most species, it develops into - veliger larva Veliger larva is with a velum, useful in swimming
• Development is indirect in some
• Phylum Mollusca is classified into seven classes

CLASS : : APLACOPHORA
• The class of mollusks which are worm like primitive forms without shell and nephridia - Aplacophora
• Foot if present is a fold that lies in - pedal groove
• Class with calcareous spicules in the cuticle is - Aplacophora
• Respiratory organs are one pair of gills in Chaetoderma and secondary gills in Neomenia.
• Ladder like nervous system is present in - Aplacophora
• Podocytes occurring on the pericardial wall help in excretion in the absence of nephridia
• Development is direct or indirect
• Eg : Neomenia, Chaetoderma

CLASS : : POLYPLACOPHORA
• This class includes - Chitons
• The class of mollusca with a dorsal shell formed by eight transvers plates - Polyplacophora Gills in Polyplacophora - six to eighty eight pairs
• Nervous system is ladder like but without ganglia
• Development is indirect with trochophore larva
• Eg : Chiton, Lepidopleurus

CLASS : : MONOPLACOPHORA
• The class of primitive molluscs which was thought to be extinct until 1952 but live forms were recovered by Galathea off the Pacific coast of Costa Rica - Monoplacophora (Galathea is an oceanographic research vessel)
• Shell in Monoplacophora is - Single and plate like
• Foot is broad and flat
• Excretion and respiration is by - 3 to 7 pairs of nephridia and 3 to 6 pairs of gills
• Internal segmentation or serial replication of internal organs in several system is one of the striking feature in Monoplacophorans
• Heart is unique with - Two pairs of auricles which opens into two ventricles
• Eg : Neopilina
CLASS : GASTROPODA

- **Largest and most diverse molluscan class** includes - snails, slugs and limpets
- Belly footed and soft bodies animals - **Gastropoda**
- Asymmetrical molluscs - **Gastropoda**
- Torsion in gastropoda occur in the visceral mass of - **Veliger**
- Head in gastropods bear - **Eyes, tactile and chaemoreceptor tentacles**
- Foot in gastropods is - **Flat creeping sole**
- Shell in gastropods - **Spirally coiled, univalve and external**
- Shell less gastropod - **Slugs**
- Shell is internal in - **Aplysia**
- **Chief organ of respiration** - **Ctenidium**
- Only class of mollusca which includes marine, fresh water terrestrial and parasitic forms - **Gastropoda**;
- **Only left nephridium, atrium and gill** are present in most of the living gastropods
- Radula is - **Present**
- Asymmetry is due to asymmetrical development of - **Torsion**
- Torsion is due to asymmetrical development of - **Shell muscles of veliger larva**

<table>
<thead>
<tr>
<th>Common name</th>
<th>Generic name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple snail</td>
<td>Pila</td>
</tr>
<tr>
<td>Limpet</td>
<td>Patella</td>
</tr>
<tr>
<td>Cowrie</td>
<td>Cypraea</td>
</tr>
<tr>
<td>Sea hare</td>
<td>Aplysia</td>
</tr>
<tr>
<td>Grey slug</td>
<td>Limax</td>
</tr>
<tr>
<td>Seal lemon</td>
<td>Doris</td>
</tr>
<tr>
<td>Land snail</td>
<td>Helix</td>
</tr>
</tbody>
</table>

CLASS : SCAPHOPODA

- Elephant tooth shells or tusk shells belong to the class - **Scaphopoda**
- Molluscs with a tubular shell slightly curved and open at both end - **Scaphopoda**
- Foot in Scaphopoda - **long and conical digging organ**
- Atria and gills in Scaphopoda - **Absent**
- Two lobes on either side of the head bearing a large number of threadlike structures are - **Captaculæ**
- Structure which help in capture of food - **Captaculæ**
- Larva - **Veliger**
  Eg: **Dentalium, Pulsellum**

CLASS :: PELECYPODA or BIVALVIA or LAMELLIBRANCHIATA

- Includes mussels, oysters, shipworms and scallops.
- A class of mollusca with a bivalved shell and axe like foot - **Pelecypoda**
- Shell in Pelecypoda is formed by - **Right and left valves**
- Head, eyes, tentacles, jaws and radula in Pelecypoda - **Absent**
- Foot is - **Wedge shaped**
- Organs of respiration in Pelecypoda - **one pair of Plate like ctedia (Lamelibranchiæ)**
- Type of feeding - **Suspension feeders or filter feeders**
- The structure present in stomach while help in digestion of starches - **Crystalline style**
• Sexuality - **Mostly unisexual**
• Most common larval form of marine Pelecypods - **Trochophore and Veliger**
• In Mytilus the thread like structure which help in helping in attaching to the substratum - **Bysus threads**
• Larva of freshwater forms like unio which is an ecto parasite on the gills of fishes and is specialised veliger is called - **Glochidium**

Eg:

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
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<tbody>
<tr>
<td>Fresh water mussel</td>
<td><strong>Unio</strong></td>
</tr>
<tr>
<td>Indian pearl oyster</td>
<td><strong>Pinctada</strong></td>
</tr>
<tr>
<td>Sea mussel</td>
<td><strong>Mytilus (attaches to substratum with byssus threads)</strong></td>
</tr>
<tr>
<td>Shipworm (or)</td>
<td><strong>Teredo</strong></td>
</tr>
<tr>
<td>Scallops</td>
<td><strong>Pecten</strong></td>
</tr>
</tbody>
</table>

**CLASS :: CEPHALOPODA**

(or) Siphonopoda

• Cephalopoda includes - **Nautilus, cuttle fishes, squids, octopuses**
• Most advanced or highly evolved class in Mollusca - **Cephalopoda**
• Highly predacious fast swimming carnivorous molluscs - **Cephalopoda**
• Foot in cephalopoda is modified into - **8 - 10 arms with suckers and siphon**
• Shell less Cephalopod - **Octopus**
• Cephalopods with internal shell - **Liligo**
• A cephalopod with an external spirally coiled, multichambered shell - **Nautilus**
• Heart in Cephalopoda - **One ventricle and 2 to 4 auricles (myogenic)**
• Shell of sepia is commonly called - **Cuttle bone**
• Shell of Liligo is commonly called - **Pen**
• The gland which provide defensive adaptation - **Ink gland**
• In Cephalopoda ctenidia are - **Dibranchiate in Sepia, Tetrabranchiate in Nautilus**
• Development in Cephalopoda - **Direct**

Eg:

<table>
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<tr>
<td>Cuttlefish</td>
<td><strong>Sepia</strong></td>
</tr>
<tr>
<td>Sea squid (or)</td>
<td><strong>Loligo</strong></td>
</tr>
<tr>
<td>Giant squid</td>
<td><strong>Architeuthis</strong></td>
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**Largest invertebrate, largest eyes in the animal kingdom**

Monoplacophora, Gastropoda, Scaphopoda, Bivalvia and Cephalopoda constitute the taxon

**Conchifera**