Classification (Mollusca) :

Order 1. Cephalaspidea

- Shell moderately developed.
- Head with the tentacular shield.
- Lateral parapodial lobes prominent.
- Examples: *Acteon*, *Hydatina*, *Bulla*.

Order 2. Anaspidea

- Found mostly in tropical or subtropical waters.
- Shell usually reduced or less covered by mantles.
- Well-developed parapodial lobes.
- Anterior end bears a pair of tentacles, a pair of rhinophores and a pair of eyes.
- Examples: *Aplysia*(sea-hare).

Order 3. Pteropoda

- Shell present or absent.
- Parapodial fins for swimming.
- With or without a mantle cavity.
- Head with a pair of rhinophores.
- Protandrous, hermaphrodites with an open sperm groove.
- Examples: *Spiratella*, *Cavolina*, *Clione*, *Corolla*.

Order 4. Sacoglossa

- With or without the shell.
- The pharynx is suctorial.
- Sperm duct closed.
- Parapodia and cerata present.

- Examples: *Oxynoe ,Elysia.*

Order 5. Acochlidiaceae,

- Minute to small-sized.

  No shell or naked snail.
- visceral mass separated from foot and covered with spicules.
- Sexes united or separate in a few.
- Inhabit coarse sand.
- Examples: *Acochlidium*, *Unela.*

Order 6. Notaspidea

- Shell external or reduced and internal.
- Parapodia absent.
- Mantle, but no mantle cavity.
- Gills bipectinate and osphradium on the right side.
- Examples: *Tylodina*, *Pleurobranchus*.

Order 7. Nudibranchia

- Shell absent.
- Internal gills, mantle cavity and osphradium absent.
- Various dorsal outgrowths.
- Respiration by secondary branchiae usually arranged in a circl around the anus.
- Examples: *Doris*, *Aeolis*.

Order 8. Pyramidellacea

- Shell typically spirally twisted.
- An operculum but gills and radula are absent.
- Long invaginable proboscis.

- Semi- parasitic.
- Example: *pyramidella.*

Order 9. Philinoglossacea

- Small naked snails.
- No gills and head appendages.
- Visceral mass separated from the foot only by a shallow groove.
- Example: *Philinoglossa*.

Order 10. Rhodopacea

- Vermiform snails.
- Without external appendages.
- Nephridia Protonephridial type.
- Anus on the right side of the body.
- Examples : *Rhodope*.

Order 11. Onchidiacea

- Slug-like without shell and with pulmonary sac.
- Mantle projects widely beyond foot.
- Head bears a pair of retractile tentacles each tipped with an eye.
- Anus and female gonopores located at the posterior end.
- Male gonopore located anteriorly.
- Examples: *Onchidium*, *Onchidella*.

Order 12. Parasita

- Endoparasitic gastropods found in the interior of holothurians.
- Extremely degenerated snails.
- Shelled embryos.
- Examples: *Entoconcha*, *Thyonicola*.

Subclass III. Pulmonata

- Mostly freshwater or terrestrial, a few marine forms.
- Shell typically spiral or reduced or absent, if present partly or completely concealed by the mantle.
- Np operculum.
- Mantle cavity transformed into a pulmonary sac with a narrow pore on the right side anteriorly.
- Gills absent.
- Heart with one auricle anterior to the ventricles.
- Nervous system secondarily symmetrical owing to the shortening or connectives and concentration of ganglionic complex.

Order 1. Basommatophora

- Freshwater, brackish water and marine forms.
- Shell delicate with a conical spire and large aperture.
- One pair of non-invaginable tentacles with eyes at their bases.
- Male and female gonopore generally separate.
- Examples: *Siphonaria*, *Lymnaea*, *Planorbis*.

Order 2. Stylommatophora

- Terrestrial pulmonates.
- Shell with conical spire, internal or absent.
- 2 pairs of invaginable tentacles with eyes at tips of the posterior pair.
- Male and female gonopore usually united.
- Examples: *Limax(slug)*, *Helix(land snail)*, *Partula*.

Class 5. Pelecypoda (Gr., pelekus, batchet+ podoa, foot)

- Aquatic, mostly marine, some freshwater forms.

- The body is bilaterally symmetrical and laterally compressed.
- Bivalve shells hinged together and mid-dorsally.
- Head is not distinct; pharynx, jaws, radula, and tentacles
- The foot is ventral, muscular which is ploughshare.
- **Mantle** bilobed, consisting of paired, right and left lobes.
- **Gills** or **ctenidia** are paired, one on each side.
- The coelom is reduced to a dorsally placed pericardium.
- The alimentary canal is coiled with large paired digestive glands.
- The heart is contained within the pericardium and comprises a median ventricle and two auricles.
- The excretory organ is paired nephridia or kidneys opens at one end into pericardium at the other end to the exterior.
- The nervous system consists typically of 4 pairs of ganglia i.e. cerebral, pleural, pedal and visceral.
- Cerebral and pleural of each side usually fused into a single Cerebro-pleural ganglion.
- Sense organs are statocyst and osphradia.
- Sexes are separate or united.
- Mostly filter-feeding.
- Development is accompanied by **metamorphosis** which usually includes a **trochophore larva.**

Order 1. Protobranchia

- Single pair of plate-like ctenidia each consisting of 2 rows of flattened gills filaments.
- Mouth placed at the base of muscular proboscides.

- Stomach with style sac.
- The foot is not compressed but has a flattened ventral surface or sole for creeping.
- Two adductor muscles present.
- Examples: *Nucula*, *Solenomya*.

Order 2. Filibranchia

- Single pair of plume-like gills formed of distinct V-shaped filaments.
- Chitinous gastric shield in the stomach developed.
- Style sac with crystalline style.
- Inter-filamentar junctions are either absent or formed by groups of inter-locking cilia.
- The inter-lamellar junction is either absent or non-vascular.
- Two adductor muscles present, anterior may be reduced or absent.
- Foot small or poorly developed.
- Examples: *Mytilus*, *Arca*.

Order 3. Pseudolamellibranchia

- Gills are plaited so as to form vertical folds.
- Inter-filamentar junctions may be ciliary or vascular.
- Inter-lamellar junctions are vascular and non-vascular.
- Single large posterior adductor muscle present.'
- Shell valve are frequently equal.
- Foot rudimentary of feebly developed.
- Examples: *Pecten*, *Ostraea*, *Melagrina*.

Order 4. Eulamellibranchia

- Gills are firm and basket-like.

- Gills filaments reflexed and fused completely to form tissue sheets.
- Gills function for food gathering.
- Gills muscles are united by vascular inter-filamentar and inter-lamellar junctions.
- Siphon of small or large size present.
- Foot large, byssus small or absent.
- Style sac short.
- Examples: *Anodonta*, *Unio*, *Cardium*, Venus, Mya, *Teredo*.

Order 5. Septibranchia

- No gills.
- Two adductor muscles present.
- Stomach lined by chitin; style sac reduced.
- Footlong and slender and byssus rudimentary or absent.
- Sexes united.
- Examples: *Poromya*, *Cuspidaria*.

Class 6. Cephalopoda (=Siphonopoda) (Gr., kephale, head+ podos, foot)

- Marine and free-swimming.
- The body is bilaterally symmetrical with head and trunk.
- Body elongated dorsoventrally.
- Shell external, internal or absent.
- Head distinct and large with well-developed eyes, foot as tentacles and siphon, radula present.
- The trunk consists of the symmetrical and **uncoiled** visceral mass.
- Mantle encloses posteriorly and ventrally a large mantle cavity.

- Foot altered into a series of **suckers bearing arms** or tentacles encircling the mouth.
- 2 or 4 pairs of bipectinate gills.
- Circulatory system **closed**, heart with 2 or 4 auricles.
- The excretory system comprises 2 or 4 pairs of nephridia.
- The nervous system is highly developed and the principal ganglia are concentrated around the oesophagus.
- Dioecious.
- Development direct.

Subclass I. Nautiloidea (=Tetrabranchia)

- Shell external, coiled or straight without complex sutures.
- Recent species with many suckerless tentacles.
- The main part of the foot encircling the mouth, divided into lobes bearing numerous tentacles.
- 2 pairs of gills, 2 pairs of nephridia.
- Ink glands and chromatophores are absent.
- Eyes are simple.
- Examples: *Nautilus*.

Subclass II. Smmonoidea

- Extinct
- Shell external and coiled with complex septa and sutures.
- Examples: *Pachydiscus*.

Subclass III. Coeloidea (=Dibranchia)

- Shell usually internal and reduced, enveloped by mantle, when external its cavity is not divided by septa.
- The main part of the foot is modified into 8 or 10 suckers bearing arms encircling mouth.
- One pair of gills, one pair nephridia.
- 2 ctenidia or gills, 2 kidney, 2c auricle, and 2 branchial heart presents.
- Ink gland duct and chromophores present.
- Eyes are complex in structures.

Order 1. Decapoda

- Body elongated often with lateral fins.
- 10 arms- 2 elongated and called tentacles bearing suckers at their distal ends and 8 short arms bear stalked suckers provided with horny rims.
- Shell is internal and well-developed.
- Nidamental glands are usually present.
- Herat enclosed in the well-developed coelom.
- Examples: *Sepia*, *Loligo*, *Spirula*.

Order 2. Octopoda

- Body is globular and bag -like and no lateral fins.
- 8 equal arms with sessile suckers without horny rims.
- Shell absent except in female *Argonauta*.
- The heart does not lie in the reduced coelom.
- Examples: *Octopus*, *Argonauta*.
