5) PHYLUM MOLLUSCA

Name of the phylum has been originated from a Latin word "molluscus" which means soft.

DIVERSITY

This is the second largest phylum of invertebrates having more than 80,000 species. In addition 35,000 fossils forms are also reported.

SHELL / PROTECTION

Molluscs are characterized by their soft bodies which are usually protected by a hard calcium carbonate shell However, Shell can be highly reduced or completely absent in some representatives of the phylum.

The shell may be in one piece or two (cuttle fish) pieces. In some mollusks the shell may be internal, reduced or totally absent (octopus).

HABITAT

They are mostly marine but many molluscs live in fresh water or even in terrestrial environment.

TRIPLOBLASTIC

They are triploblastic animals possessing bilateral symmetry. They are coelomate.

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BODY PLAN

The body plan of mollusks consist of a head, a dorsal visceral hump and a ventral mascular foot and the mantle.

1. FOOT

The foot is used for movement (especially in gastropods (e.g snail) or as an anchor (as observed in chitons)

2. VISCERAL HUMP (The visceral hump is mostly contained within the shell)

The visceral hump /visceral mass houses most of the internal organs e·g the stomach, gonads, and heart.

3. MANTLE

The mantle is the tissue layer that covers the visceral mass. The mantle is the tough, fleshy membrane which covers the body. In organisms that have shells, the mantle produces the shell.

MANTLE CAVITY

The space between the body and mantle is called mantle cavity in which kidneys and anus open.

4. MOUTH

Underneath the mantle is a mouth at one end.

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RADULA

Mollusks have a rasping tongue called radula. Radula is used to scrape food particles from hard surfacer. For example, the radula of mollusks cleans algae off of the surfaces in aquariums.

RESPIRATION

They respire through gills present in mantle cavity. They may also respire through lungs, mantle or by body surface.

BODY CAVITY / HAEMOCOEL

The main body cavity is haemocoel through which blood & coelomic fluid circulate & which encloses most of internal organs.

DIGESTIVE SYSTEM

The digestive system is well developed. Digestive system is complex having rasping organ radula and anus usually emptying into mantle cavity.

CIRCULATORY SYSTEM

Blood vascular system consists of a single heart (with one ventricle and one or two auricles), arteries, veins or hoemocoelic chambers. The blood is without any respiratory pigment and therefore, colourless containing white blood cells.

In certain molluscs like octopus and

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cuttle fish a blue coloured respiratory pigment haemocyanin is present. The blue colour of the pigment is due to the presence of a copper molecule (as iron in haemoglobin). Haemocyanin can transport three times more oxygen as compared to haemoglobin.

NERVOUS SYSTEM

Nervous system consists of three pairs of orange coloured ganglia connected by nerve cords. Nerves arise from the ganglia and enter different organs of the body.

FERTILIZATION

Sexes are generally separate. The testes are white and ovaries are of reddish colour. Fertilization is external and is performed in the gills.

DEVELOPMENT

Development is either direct or a larva is formed called Glochidium larva.

COMMON EXAMPLES

Common examples of this phylum are garden snail (Helix aspersa), slug (Limax maximus), Freshwater mussel (Anodonta grandis), marine mussel (Mytilus edulis), oyster (Ostrea lurida) which makes pearl, squid (Loligo pealii)

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cuttle fish (Sepia officinalis) and Octopus (Octopus bairdi)

CLASSES OF PHYLUM MOLLUSCA

It has four classes:

1. Class Glastropoda
2. Class Bivalvia
3. Class Cephalopoda
4. Class Polyplacophora

1. CLASS GLASTROPODA

Class Glastropoda (meaning 'stomach foot') includes snails, slugs, and nudibranchs. Most snails have a coiled shell, however, the shell is completely absent in nudibranchs. Gastropods have terrestrial, marine, and freshwater representatives. Terrestrial gastropods (e.g snails) lack the gills that are characteristics of other mollusks. In gastropods, foot secretes mucus as a lubricant to aid movement.

2. CLASS BIVALVIA

Class Bivalvia includes mussels, oysters, and clams. Bivalves have a reduced head and two hinged shells connected by strong adductor muscles.

3. CLASS CEPHALOPODA

Class Cephalopoda includes octopuses, squid, cuttlefish, and chambered nautiluses. Cephalopods have a head surrounded

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by tentacles, which can be used for locomotion and grasping prey. The shells (also called pens) of squid and cuttlefish are reduced and internal.

4. CLASS POLYPLACOPHORA

Class Polyplacophora includes the chitons. These flat organisms are often observed adhering to rocks in the intertidal zone.

ECONOMIC IMPORTANCE OF MOLLUSKS

Animals of Phylum Mollusca are economically very important.

Shells of molluscs are used as ornaments and are also used to make decoration pieces. The pearl formed by marine mussel is used in jewellery. Shells and pearls are also used as a source of minerals in many allopathic and unani mediciner. Octopus and cuttle fish and large sized mussels are eaten as delicacy in many countries of the world.

EXAMPLES

1. Snails
2. Octopus
3. Squids
4. Oyster.

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