Practical 5.

**A) Study of Shell:- Chiton, Pila, Sepia, Pecten, Dentalium**

**B) Study of Foot:- Chiton, Patella, Aplysia, Sepia, Octopus, Dentalium**

1. **Study of Shell:-** The shell is hard, calcareous protective exoskeleton of mollulscan animals secreted by mantle of velliger larva. It is made up of three layers viz. outermost periostracum, middle prismatic layer and innermost lacreous or pearly layer. Periostracum is formed of an organic substance conchiolin, prismatic layer is made up of calcareous plates and lacreous layer is made up alternate conchiolin and calacareous plates. Shell is usually external, sometimes internal. There are different varieties of shells according to the form, structure, habit and habitat of the molluscs.
2. **ShellofChiton**- Dorsoventrally flat elliptical body of chiton is dorsally covered with the shell which is made up of eight transverse overlapping plates forming a solid armor. First plate is called as cephalic and the eighth is called as anal plate. Plates are calcareous, keeled middorsally and arranged in longitudinal row. Plates are movable on one another allowing the animal to roll into a ball like structure when in danger.
3. **Shellof Pila-**

Globose body of pila is covered with lemon yellow brownish and blackish shell. The shell is globose in shape, spiraly coiled around the central axis-collumella. Shell coiling is clockwise (dextral) or anticlockwise (sinistral). Smallest and the oldest whorl is the apex whorl whereas the largest whorl is the body whorl. The whole series of whorls other than these is known as spirae. Opening or mouth of the shell is called as peristome. It is bounded by inner and outer lips. Mouth is tightly closed by thick oblong plate - the operculum. The foot is attached to the operculum with the help of muscles. Vertical lines on the whorls are called as varices. Varix is the single longitudinal line extending from apex whorl to body whorl. Outer side of operculum shows concentric lines of growth whereas its inner side shows oval area called boss for attachment of foot muscles.

1. **Shellof Sepia-**

The shell of sepia is internal, embedded in a sac of the mantle on the dorsal side. It is flat, broad and oval in shape. Broader and rounded oral end of the shell is called as *pro-ostracum* and a narrow, pointed aboral end is called as *rostrum.* Rostrum projects posteriorly into a spine. Shell is entirely dead and is calcareous in nature. It provides rigidity to trunk, like an endoskeleton. Calcareous matter is arranged in layers, enclosing spaces containing fluid and gas. Shell serves as a float and helps in maintaining the equilibrium of the body. Sepia is commonly called as cuttle fish. Shell of sepia is known as cuttle bone which is used as a source of calcium in the poultry feed and Unani medicine.

1. **Shellof Pecten-**

The shell of the bivalve mollusc pecten is consisting of two unequal valves-a left and a right valve. The animal normally rests on its right valve. Shells are bilaterally symmetrical and show lines of growth originating at the center of the hinge, at a spot called the beak*.* Beak issurrounded by a raised area called as umbo. These growth rings increase in size downwards until they reach the curved ventral edge of the shell. The streamlined shell of pecten facilitates movement during swimming and also provides protection from predators. Ridges on the valves (ribs) provide architectural strength to the shell. A comb-like structure [ctenolium](http://en.wikipedia.org/w/index.php?title=Ctenolium&action=edit&redlink=1) located next to the byssal notch during the developmental stage is a unique feature of pecten.

1. **Shell of dentalium -**

Elongated bilaterally symmetrical body of dentalium is enclosed in a white, cylindrical, tubular external shell. Shell is slightly curved, unchambered, tapering and open at both the ends. It is shaped like a trumpet or elephant’s tusk hence often called as tusk shell. During life shell is buried obliquely in mud with wider anterior end lying deepest in the mud and narrow posterior end projecting above the surface. There is no operculum.

1. **Study of Foot:- Chiton, Patella, Aplysia, Sepia, Octopus, Dentalium**

Ventral muscular podium or foot distinct from rest of the body is one of the most characteristic organ of mollusca. Foot presents various modifications as an adaption to different modes of life and locomotion.

1. **Foot of Chiton**– Chitons are generally found adhered to the smooth rock surfaces with the help of foot. The large, elliptical and muscular foot occupies the major portion of the ventral surface. Flat sole of foot secretes slimy secretion. It serves as a sucker to adhere firmly to rocks when at rest. Propulsion during creeping is accomplished by mucus and waves of muscular activity.
2. **Foot of Patella-** Patella is a sluggish marine gastropod found attached to the rocks. The foot is simple elongated, undivided flat and ventral in position. Unicellular or multicellular mucus secreting pedal glands are present in the foot. It is adapted for clinging and moving on rocky surface. It acts as a holdfast organ to secure attachment. It also produces creeping movements by muscular wave of contraction of longitudinal muscles passing over the sole. It leaves behind a mucus slimy trail while creeping. Muscular contraction may be forward or backward.
3. **Foot of Aplysia** – Aplysia is commonly called as sea-hare. It is a found crawling over the surface of rocks. A flat, narrow creeping foot lies along the midline of the ventral surface.  It bears a pair of lateral muscular folds- the parapodia. Parapodia form lateral fin like structures, which are useful for swimming. Swimming is achieved by rhythmic waves passing along the parapodia. Parapodia can be folded and united over the head forming a sac through which water can be expelled forcibly like a jet. Posterior extremity of the foot is modified to form a sucker for attachment while the anterior end is elevated above the substratum.   The foot extends posterior to the body as a short tail.

1. **Foot of Sepia**

Foot is modified into 5 pairs of tapering muscular cephalic/ circum oral arms which surrounds the mouth. These are differentiated into 4 pairs of short and stout arms and one pair of long tentacles. The tentacles are used for capturing of prey and copulation. The inner float surface bears four rows of suckers which can be firmly applied to the body of the prey by creating the vacuum inside. In male the left fourth-ventral arm is modified into intromittent organ.

1. **Foot of Octopus-**

Foot is modified into 4 pairs of elongated muscular cephalic/ circum oral arms which surrounds the mouth and bear sessile suckers in two rows on their surfaces. These arms are joined together at their bases by web. Octopus do not have feet, they have eight **arms,** usually bearing suction cups. They crawl by walking on their arms, usually on many at once, on both solid and soft surfaces, while supported in water. The male uses a special arm to place sperms in the female. Octopuses swim by expelling a jet of water from a contractile [mantle](http://en.wikipedia.org/wiki/Mantle_%28mollusc%29), and aiming it by a muscular [siphon](http://en.wikipedia.org/wiki/Siphon_%28molluscs%29).

1. **Foot of Dentalium -**

Dentalium is a marine form; with a tusk like shell. The foot protrudes through the

oral end of the shell (the broader end). The foot is narrow cylindrical and tongue shaped. It is muscular and used for digging. The lower end of the foot is conical and trilobed. It has on each side a wing like fold or pleat. When the animal wants to use its foot for digging, the foot is filled with blood. This makes the foot hard. It is now buried deep in the sand. The foot contracts and the animal is firmly anchored in the sand. After the animal has exhausted the food supply in the area, the blood supply to the foot is withdrawn and the foot becomes limp. It can now withdraw its foot from the sand, to go else where in search of food.