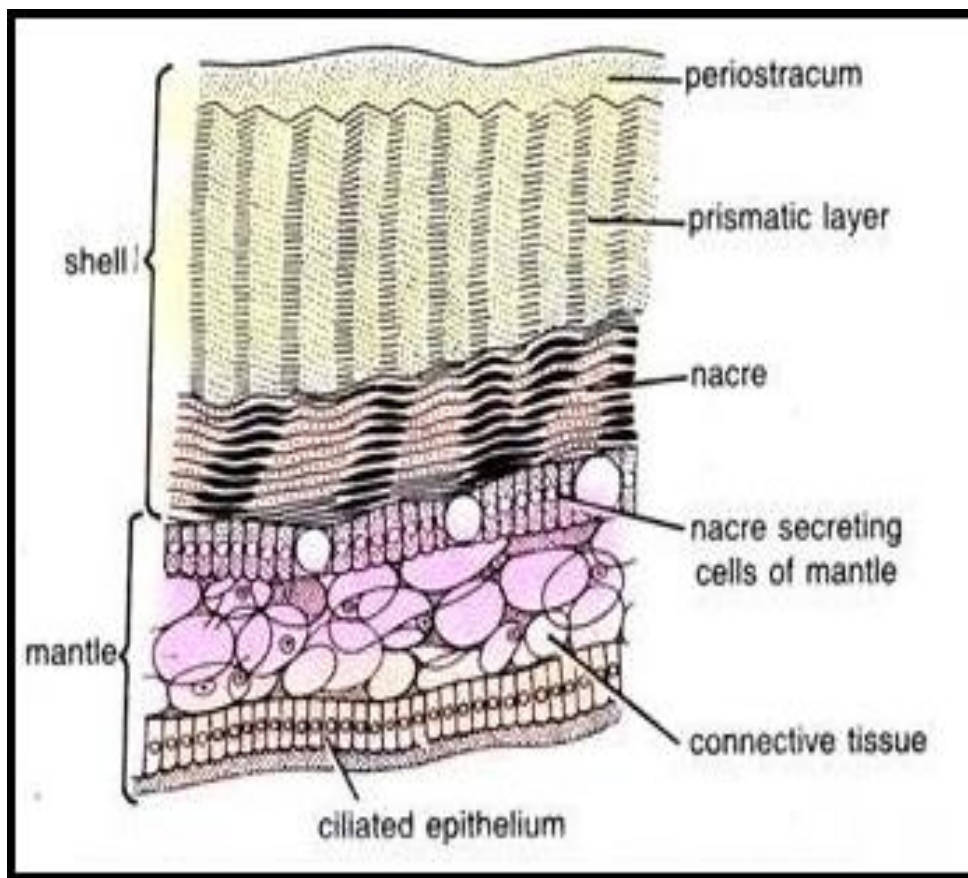


Dr. Minakshi Kumari  
P.G. Dept. Of Zoology,  
Maharaja College, ARA.

B.Sc. Part-I,  
Zoology (Hons.)  
Paper- I-A(Mollusca)

## Histology of the shell : *Unio*

Histologically, the shell consists of three distinct layers:



**Fig : A. *Unio*. (T.S. of a part of shell and mantle)**

- 1. Periostracum :** The thin outermost horny layer made of conchiolin, a substance related to chitin, and imparts brownish colour to the shell.

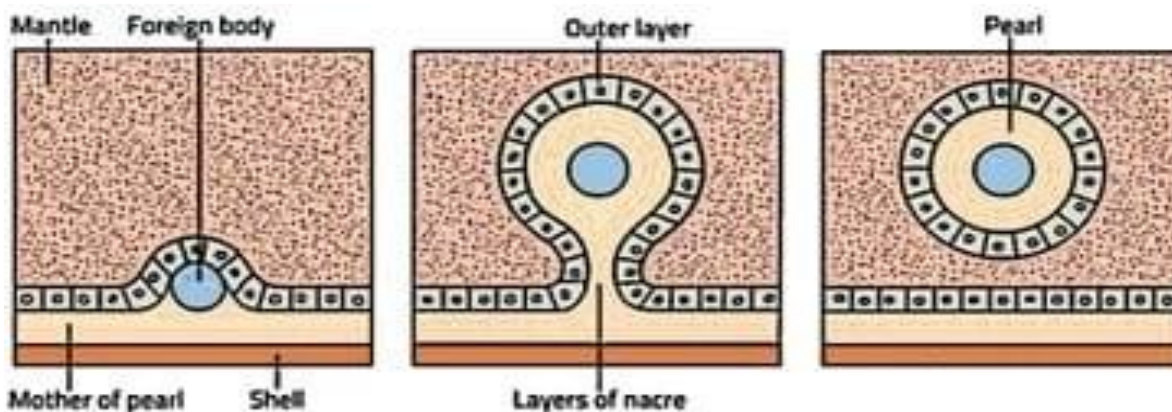
## 2. Ostracum or prismatic layer :

The thick middle layer, composed of alternate layers of conchiolin and prisms of calcic substances.

## 3. Nacreous layer or mother of pearl:

The innermost nacreous layer or the “**mother-of-pearl**” layer is made of alternate layers of calcium carbonate ( $\text{CaCO}_3$ ) and conchiolin.

The layer is smooth and lustrous. The periostracum and ostracism are secreted by the mantle edge; soft and horny in colour at the beginning, which hardens with subsequent deposition of materials. The nacreous layer is secreted by the outer surface of the mantle. Pearls is secreted by this layer.



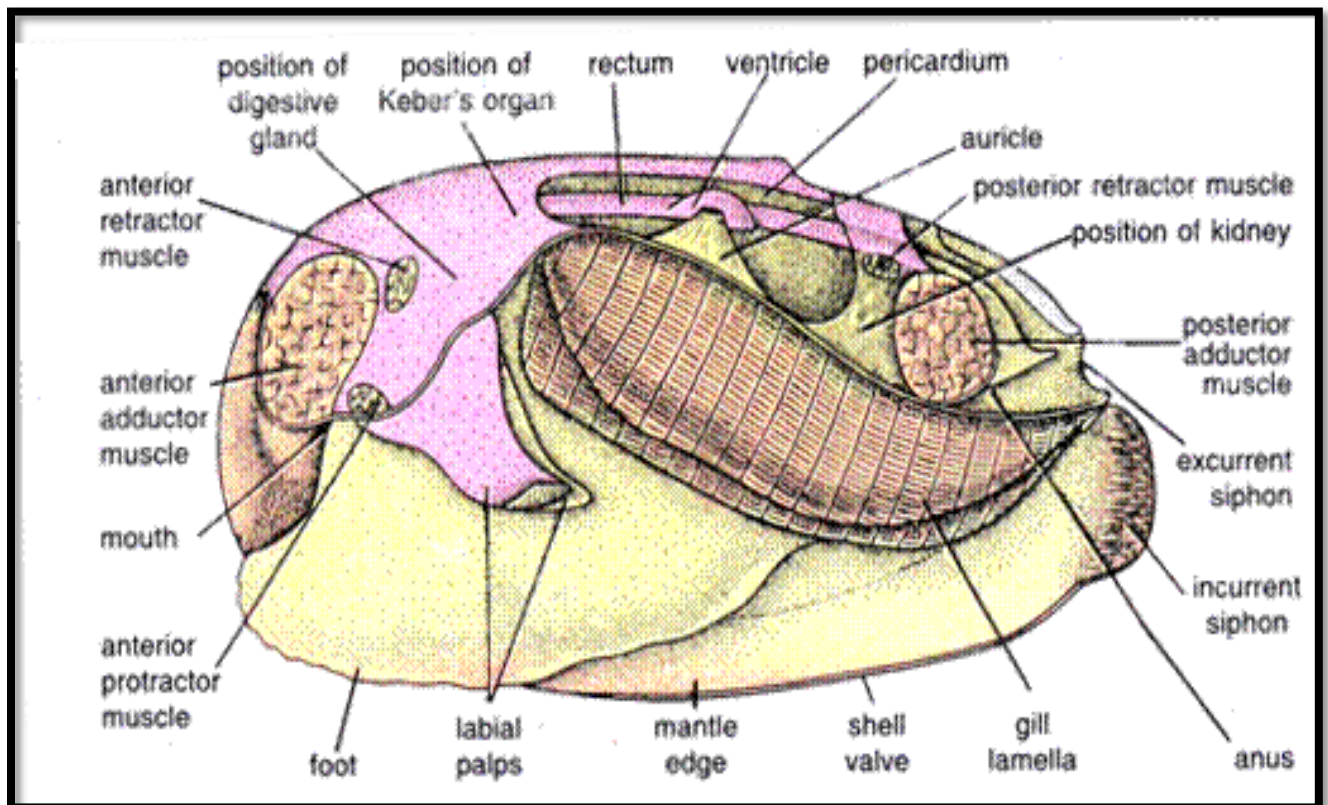
**Fig: B. Formation of a pearl**

## **Mantle and Mantle Cavity :**

Lining the inner surface of the shell valves is a semi-transparent mantle or pallium which is made of two lobes ,which are attached dorsally to the body and ventrally to the shell valves along the pallial line.

It is like skin, it encloses the soft parts and also hangs down like a skirt enclosed by the mantle is a mantle cavity which extends the entire length of the body on each side. **The mantle cavity can be divided into two chambers, a large ventral, infra-branchial chamber and a smaller dorsal supra-branchial chamber.**

The bases of ctenidia mark the partition between these chambers. The mantle encloses the body in the upper half, and a muscular foot on the mid-ventral side.



**Fig : C .Internal features of Unio**

**The gills or ctenidia** are two in numbers and hang in the mantle cavity, one on either side of the foot. Each gill is characteristically folded to form two laminae each comprising two lamellae. The gills are plate – like structures, formed by the fusion of successive branchial Or gill filaments.

The lower border or edge of each mantle lobe is thickened and contains muscles, the muscles attach the mantle to the shell valve along a pallial line.

The thickened lower border of the mantle has three parallel lobes or folds, the innermost fold is the largest and it is this fold which contains muscles which are both radial and circular, it controls the flow of water. The middle fold is sensory in function.

The outer fold secretes the shell, the inner surface of the outer fold lays down the periostracum, while its outer surface secretes the prismatic and nacreous layers, but the nacreous layer is also secreted by the entire outer surface of the mantle.

The mantle secretes a pearl in many bivalves when any foreign particle lodges between the shell and the mantle, the pearl is formed in concentric layers around the foreign particle. The posterior edges of the mantle lobes are also thickened and they project outside the shell as two short tubes, a dorsal exhalant siphon and a ventral inhalant siphon.

The exhalant siphon is an actual tube formed by the fusion of the two lobes of the mantle, but the inhalant siphon is a temporary tube formed by approximation of mantle lobes, it has delicate fimbriae at its edges. Water enters through the inhalant siphon and after circulating it passes out through the exhalant siphon.

**Histologically, the mantle consists of :**

- ( i) An outer columnar epithelium beset with nacre- secreting cells.
- (ii) A middle fibrous connective tissue, and
- (iii) An inner ciliated epithelium containing mucus- secreting cells.

