UG CBCS Semester-1
Phylum: Ctenophora

General Characteristics

The Ctenophora, commonly known as sea walnuts or comb jellies, are animals with biradial symmetry, epidermal and gastrodermal layers like those of coelenterates, definite muscular elements and a mesenchymal middle layer (collenchyme) that are both derived from mesoderm, and eight meridional rows of swimming plates or combs formed of fused cilia. The arrangement of comb plates gives the appearance of radial symmetry; the tentacles and branching of gastro vascular canals are of bilateral type.

All ctenophores are exclusively marine. They feed on plankton, swim by cilia. Power of regeneration is well marked. Bioluminescence (the property of living organism to emit light) is well-marked in cteno phores. They are diploblastic having ectoderm and endoderm. Tissue level of organization is present. Tentacles may or may not be present. When present, they are two in number. The body wall consists of outer epidermis, inner gastro-dermis and middle mesogloea (= collenchyma). The mesogloea is different from that of cnidaria as it contains amoebocytes, elastic fibres and muscle cells. From this reason ctenophores may be considered as "triploblastic". Special adhesive cells called colloblasts (= lasso cells), are present in the epidermis of tentacles which help in food capture.

Digestive Tract (= Gastro vascular tract) consists of mouth, pharynx or stomodaeum, stomach or infundibulum, anal canals and two anal pores. The stomach is highly branched to form a complex system of gastro vascular canals. Since there are mouth and anal pores, the digestive tract is complete. Digestion is both extracellular and intracellular. Circulatory, respiratory and excretory systems are absent. The nervous system is diffused as in cnidarians. The aboral end (opposite end of mouth) bears a sense organ, called statocyst for equilibrium (balance). Locomotion is effected by the beating of the combs, which has been much studied as an example of ciliary action controlled by a nervous system. In addition to a coelenterate-type nerve plexus throughout the body, nervous elements are concentrated beneath the ciliary rows. They are monoecious (= hermaphrodite or bisexual). Fertilization is generally external. Asexual reproduction is not present. Paedogenesis is common. Egg contains yolk, hence called lecithal. Yolk is initially accumulated at the centre (centrolecithal condition) but later on when cleavage starts yolk shifts to one side (telolecithal condition). Cleavage is complete, holoblastic, unequal, biradial and deter minate (a complete embryo is formed if all the blastomeres remain together). Gastrulation occurs by epiboly. The development is indirect with a ciliated sphencal cydippid larva.

Unique Features:

1. Comb like ciliary plates for swimming,
2. Special adhesive cells, the colloblasts for capturing the prey,
3. Mesogloea with amoebocytes and smooth muscle cells,
4. Two anal pores.

Advancement over Cnidaria:

1. Triploblastic origin of tissue,
2. Independent muscle cells,
3. Complete digestive tract,
4. Determinate Cleavage.

Classification

Class I: Tentaculata

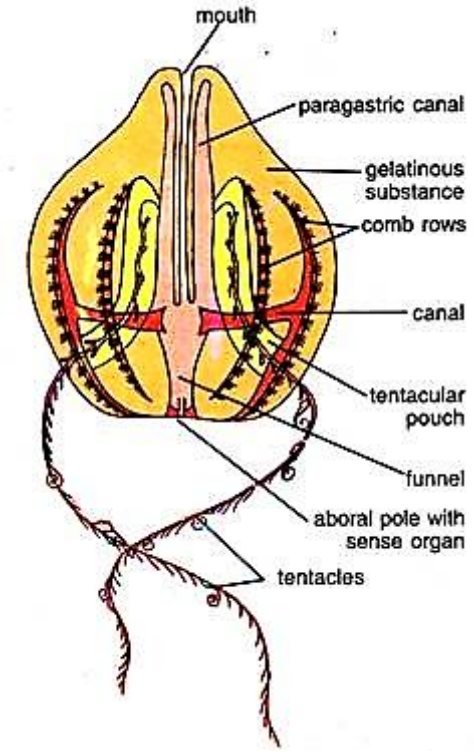
They have tentacles and small stomodaeum. Examples: *Hormiphora* (The Sea Walnut), *Pleurobrachia* (The Sea gooseberry), *Ctenoplana, Cestum* (The Venus' Girdle).

Class II: Nuda

Their body is without tentacles. They has spaceous mouth and stomodaeum. Example: *Beroe*.

***Pleurobrachia* — the Sea Gooseberry:**

Pleurobrachia reproduces only sexually. Life history includes a cydippid larva. Power of regeneration is well marked. The tentacles bear special adhesive cells, the lasso cells or colloblasts which help in food capture. The broad end called aboral pole, contains the anal canals, anal pores and a sense organ, the statocyst. The animal is hermaphrodite.



Pleurobrachia