
Coelenterates

The coelenterates are aquatic invertebrates of highly varied form which are the most simply organized animals having well-developed body tissues. Except for a very few kinds adapted for existence in fresh waters, they are all inhabitants of the sea. A majority grows together as colonies, but solitary individuals occur also. Many are attached throughout life to part of the sea bottom, whereas others, including both individuals and colonial assemblages, float or swim about freely. Chief groups are the corals, sea anemones, jelly-fishes, and plantlike colonies of hydroids.

The word coelenterate (*coel*, hollow; *enteron*, gut) was originally applied to the sponges as well as to hydrozoans, scyphozoans, and anthozoans, which are included in the phylum, but sponges now are recognized as separate phyla.

The chief characteristic of the coelenterates is their radial symmetry and the presence of a two-layered body wall surrounding a space to which the mouth gives both entrance and exit.

The size of most individual coelenterate animals is small. Those attached, whether solitary or growing together as colonies are termed polyps. The unattached jellyfish types, which commonly have a fringed umbrella-like form, are known as medusae. The individual polyps range in diameter and length from less than 1 mm. to as much as 1 m. (some anemones). Most medusae have a diameter of 10 to 50 mm.

Characters of representative modern Coelenterates:

Significant structural features and mode of growth of coelenterates in general may be studied advantageously by observation of three common modern genera. These are *Hydra*, which grows as a small solitary individual; *Obelia*, which has a colonial mode of growth; and *Metridium*, a common sea anemone, which is noncolonial. The first two belong to the major division of coelenterates called **Hydrozoa**, and the third to the class **Anthozoa**, which includes the corals.

1- Hydra, a Simple Hydrozoan:

Hydra is one of the simplest of tissue-bearing animals, which has a flexible body of slender cylindrical form, generally 1 inch or less in length (Fig. 1). One end of the body is closed, forming a basal disk for attachment to foreign objects.

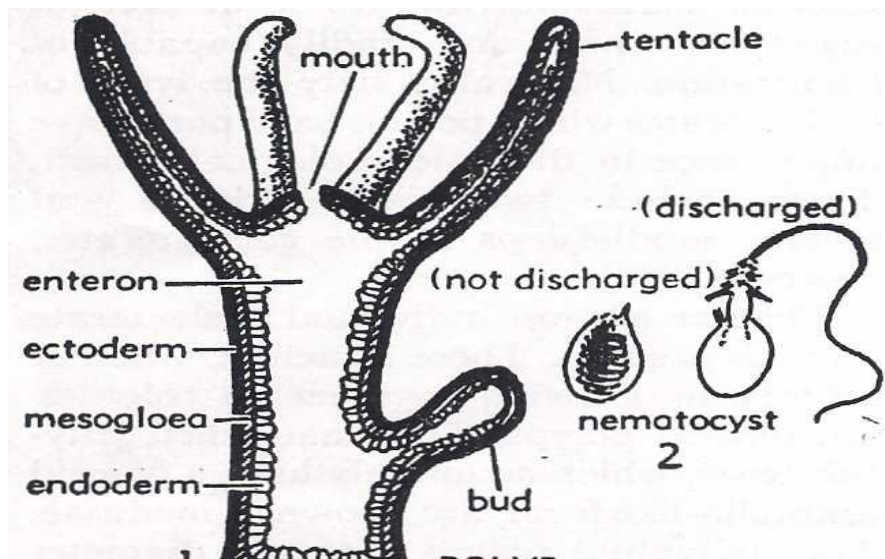


Figure (1) Simple hydrozoan polyp and stinging cells. The common fresh-water coelenterate known as *Hydra* (1) has a saclike body formed by two layers of cell-built tissue, with a noncellular gelatinous substance between them. Tentacles surround the mouth, which opens directly into an undivided digestive cavity. Stinging cells (2) occur in the body wall.

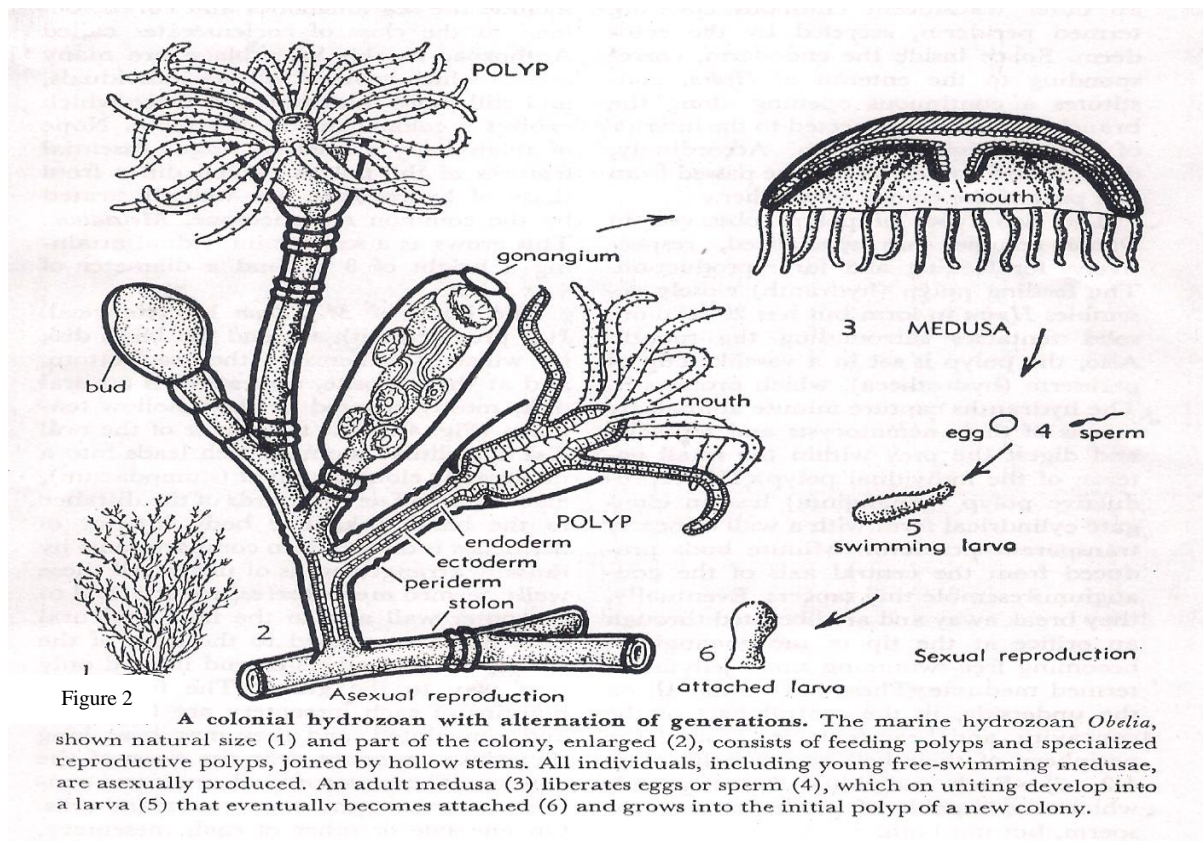
The opposite end bears a small opening which is the mouth. It leads directly to the digestive tract comprising all of the interior part of the body. There is no throat or gullet, and the body interior is not subdivided in any way. Surrounding the mouth are 6 to 10 slender tentacles arranged in radial manner, each consisting of a hollow extension of the body cavity, like the finger of a glove.

A- Obelia, a Colonial Hydrozoan:

The vast majority of coelenterates are animals of shallow seas. Most of them are colonial. Obelia is a typical, relatively simple representative of the colonial hydrozoans.

A colony of *Obelia* comprises a soft tuft of threadlike branching stems which bear hundreds of microscopic polyps (Fig. 2). Such a colony may have a height and width of approximately 1 inch. Although the branches are flexible, the colony is attached in a fixed position by a rootlike base; thus, the polyps cannot move from place to place, like *Hydra*.

medusae have a mouth on the underside, the central part of the concavity, and bear tentacles around the periphery of their bell or umbrella (Fig. 2, 3).



B- Metridium, an Anthozoan

Marine polyps of flower-like form, which include the sea anemones and corals, belong to the class of coelenterates called Anthozoa. In this assemblage are many genera which grow as solitary individuals, and still more numerous are those which exhibit a colonial mode of growth. None of them have a medusa stage. Essential features of the polyps, which differ from those of hydrozoans, are well illustrated by the common sea anemone, *Metridium*. This grows as a solitary individual attaining a height of 8 in. and a diameter of 4 or 5 inch.

The body of *Metridium* is cylindrical. It is provided with a broad flat basal disk by which it adheres to the sea bottom, and at the opposite, upper end is an oral disk, mostly covered by short hollow tentacles (Fig. 3).

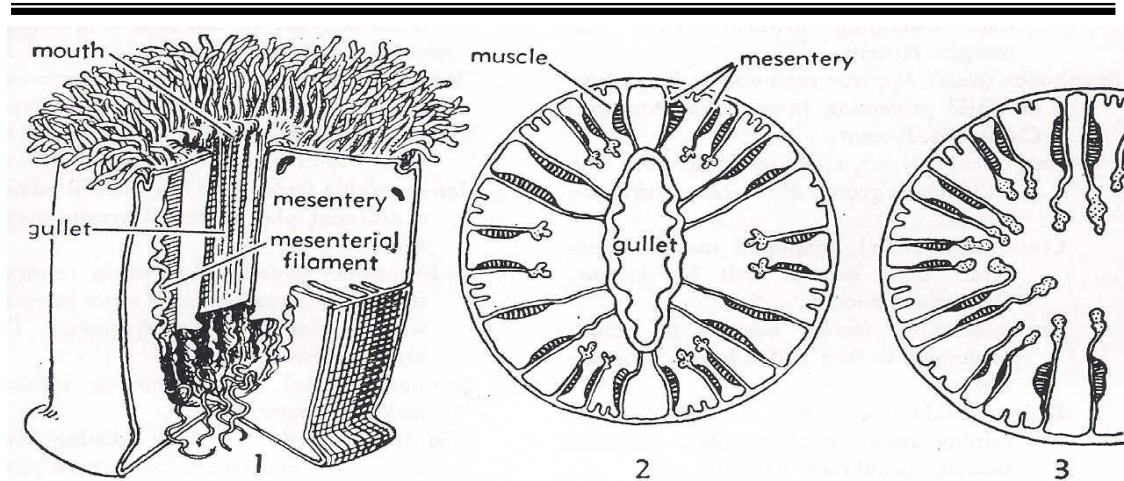


Figure (3). An anthozoan polyp; the common sea anemone. A sectional view of a small *Metridium* (1), natural size, shows the slitlike mouth surrounded by tentacles, the gullet, and radial divisions of the digestive cavity, called mesenteries. Transverse sections of the oody, which lacks hard parts, show structure at mid-length of the gullet (2) and just below the gullet (3). Muscle bands run vertically (longitudinally) on infacing sides of mesentery pairs, except those termed directive mesenteries located at narrow extremities of the gullet.

Classification of Coelenterates:

1- Hydrozoa (*class*), solitary or colonial, gullet lacking, Cambrian - Recent.

2- Scyphozoa (*class*), the true medusae or jellyfishes; no shelf projecting inward from margin, Cambrian - Recent.

3- Anthozoa (*class*), polypoid generations only, possess gullet and mesenteries, solitary or colonial, Ordovician - Recent.

A- Alcyonaria (*subclass*), polyps has eight pinnate tentacles, colonial, Triassic - Recent.

B- Tabulata (*subclass*), extinct colonial corals characterized by presence of tabulae but weak or absent septa, Ordovician - Jurassic.

C- Zoantharia (*subclass*), corals and sea anemones, tentacles simple, six primary pairs of mesenteries, solitary or colonial, with or without skeleton but not consisting of loose spicules, Ordovician - Recent.