# **Microscopic Organization of Sycon**

The microscopic organisation shows the presence of a single layer of cells covering the outer surface of the body. This outer layer is designated as the dermal layer. Needlelike spicules are seen to project from this layer. This layer is composed of large cells called the pinacocytes.

The spongocoel is lined by a layer of flattened endodermal cells, Radial canals are lined by peculiar collar cells, each having a long whip-like flagellum. These cells are called the choanocytes or collar cells or gastral cells.

Each choanocyte has a round or oval body. It possesses a nucleus and one or many vacuoles in its cytoplasm. The free end of the cell body has a comparatively longer flagellum and the base of the flagellum is surrounded by a contractile transparent collar-like outgrowth of the cytoplasm.

The flagellum arises from the basal granule which is connected with the blepharoplast by a root called rhizoplast. Electron microscopic studies have revealed that the collar-like outgrowth is composed of cytoplasmic tentacles. The number of such tentacles varies from 20 to 30. The sectional view of flagellum under E. M. reveals the pattern of 9 + 2 arrangement of microtubules, like the flagella of flagellates.

The spicules, which constitute the skeleton of Sycon, develop from the scleroblasts. These structures are regularly arranged and protect the softer parts. Triradiate as well as tetraradiate spicules are common. Besides these, simple club-like oxeote spicules are also present.

The intermediate layer, called mesohyl or mesenchyme, which consists of a gelatinous proteinaceous matrix, contains spicules and numerous amoeboid cells.



## The amoeboids are of many types and are as follows

## 1. Archaeocytes:

They are undifferentiated embryonic amoebocytes which are large in size and their nuclei show distinct nucleoli. They are totipotent in nature and can transform into different kinds of cells, needed by the animal. They play a role of digestion, eliminating waste material and can give rise to both sperms and ova.

## 2. Collenocytes:

Most of the other cells are smaller and stellate-shaped and possess radiating processes. These cells are usually called collenocytes or connective tissue cells. They remain fixed by cytoplasmic processes.

## 3. Chromocytes:

These are pigmented amoebocytes with lobose pseudopodia.

#### 4. Thesocytes:

These amoebocytes are storage cells with lobose pseudopodia.

#### 5. Myocytes:

These are fusiform and highly contractile cells, found around the osculum, apopyles and other pores. These cells are arranged in circular fashion and act as a sphincter and regulate the diameter of the openings. So water flow through osculum is regulated.

#### 6. Gland cells:

These cells are found attached to the body surface by long strands and -secret lime. The osculum, prosopyles and apopyles have elongated narrow cells which prolong into narrow fibres around the aforesaid apertures and help them to close, when necessary.

# Nutrition, Respiration and Excretion in Sycon

The sponges feed on micro-organisms which enter into the body along with the water current. The choanocytes engulf them and pass them to the amoeboid cells situated below the choanocytes. The digestion takes place inside the amoeboid cells and assimilated products are conveyed to the various parts of the body. Thus nuitration is holozoic and digestion is intracellular, a process comparable to that of protozoans. Some amoeboid cells often contain chlorophyll or green pigments and carry out autotrophic nutrition like green plants.

The presence of algae within the sponge body also helps in nutrition. Respiration and excretion take place by diffusion. The contractile vacuoles are recorded in the amoeboid cells of freshwater sponges which probably play important role in osmoregulation and excretion.