

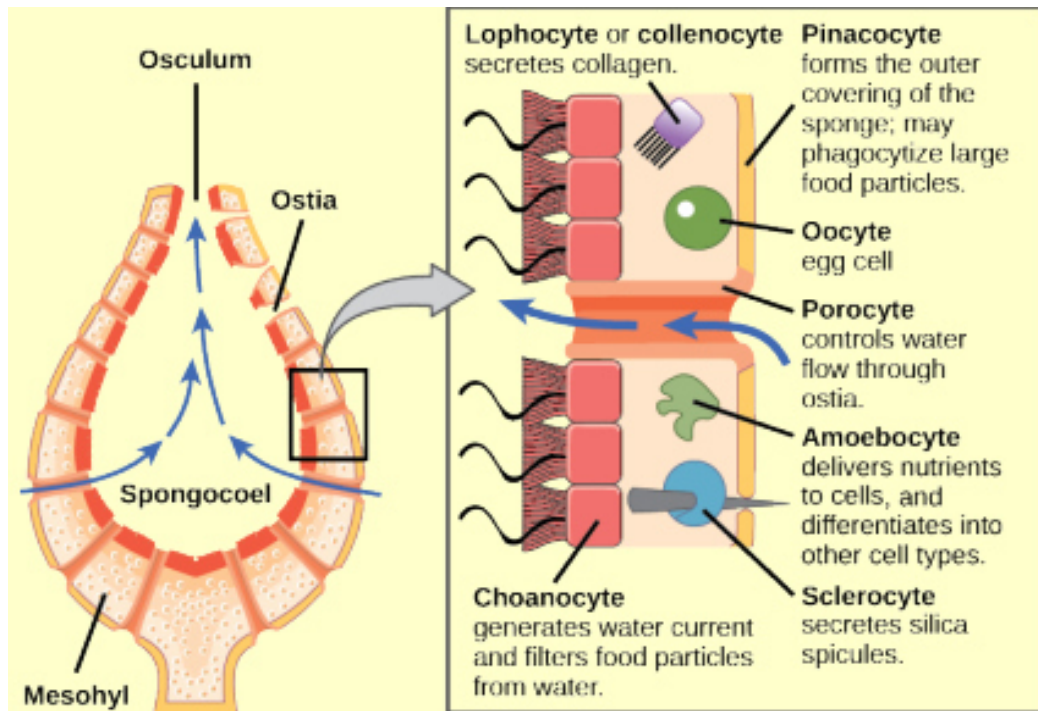
UNIT 2 .PORIFERA

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Phylum Porifera refers to the pore bearing species are the oldest metazoan group. About 5000 - 10000 spp. are found in world. Poriferans are pore bearing first lower multicellular animals belonging to the kingdom of Animalia. The Body of porifera is consists of paragastric cavity which opens out through osculum and Canal system is well developed. The skeleton of body is formed by spicules which are calcareous, silicious, and proteinous in nature. The body of porifera is consisting of outer ectoderm and inner endoderm with an intermediate layer of mesenchyme. The body surface is perforated by numerous pores, the Ostia through which water enters the body and one or more large openings, the oscula by which the water exists. Poriferans are attached to rocks, stones or shells or wooden pieces in the waters or coral to provide a suitable substratum. The Poriferans have a spongy appearance and are therefore called sponges. The sponge's body is vase-like, tubular, cylindrical in shape with different colours like bright red, yellow, orange, and pink or violet or even white and black. Sponges are colonial in nature and found in all seas.

Sponge larvae (e.g, parenchymula and amphiblastula) are flagellated and able to swim; however, adults are non-motile and spend their life attached to a substratum. Since water is vital to sponges for feeding, excretion, and gas exchange, their body structure facilitates the movement of water through the sponge. Various canals, chambers, and cavities enable water to move through the sponge to allow the exchange of food and waste as well as the exchange of gases to nearly all body cells.

Water enters into the spongocoel through numerous pores, or ostia, that create openings in the body wall. Water entering the spongocoel is expelled via a large common opening called the osculum. However, we should note that sponges exhibit a range of diversity in body forms, including variations in the size and shape of the spongocoel, as well as the number and arrangement of feeding chambers within the body wall. In some sponges, multiple feeding chambers open off of a central spongocoel and in others, several feeding chambers connecting to one another may lie between the entry pores and the spongocoel.

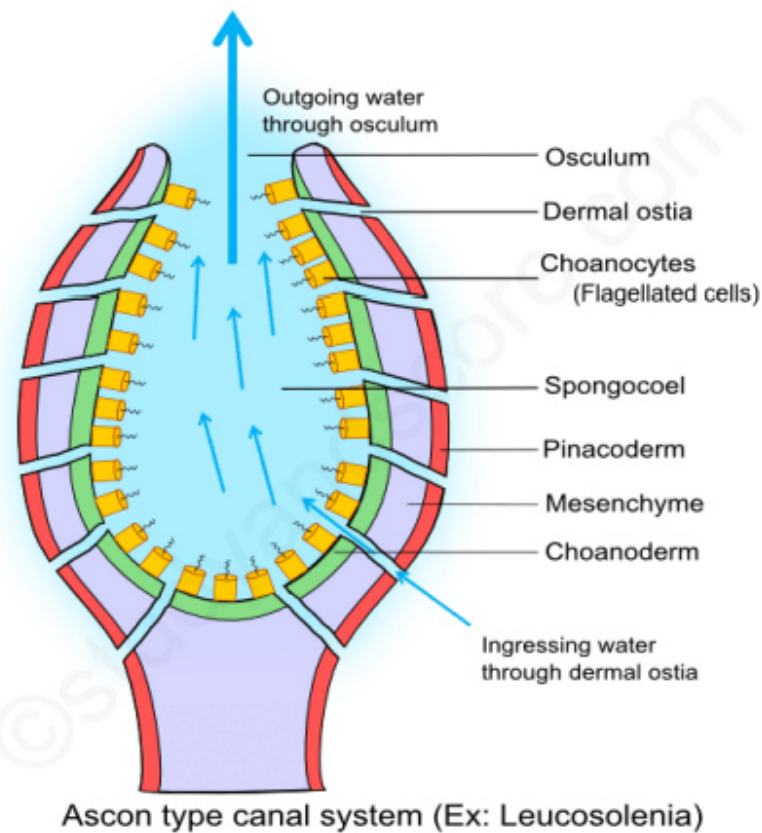


Sponges lack complex digestive, respiratory gas exchange, circulatory, and nervous systems. Their food is trapped as water passes through the ostia and out through the osculum. Bacteria smaller than 0.5 microns in size are trapped by choanocytes, which are the principal cells engaged in feeding, and are ingested by phagocytosis. However, particles that are larger than the ostia may be phagocytized at the sponge's surface by pinacocytes.

PHYLUM PORIFERA HAVE FOUND THREE TYPE CANAL SYSTEM

ASCON TYPE CANAL SYSTEM: It is the simplest type of canal system and is found in *Leucosolenia*.

1. Ostia present on the surface of body and lead directly into the spongocoel.
2. It is lined by flagellated choanocyte cells.
3. Spongocoel opens to the outside through a narrow circular opening, the osculum located at the distal free end of the sponge body.
4. In which, water enters through ostia into spongocoel and goes out of body through the osculum.



2. SYCON TYPE CANAL SYSTEM: This type of canal system is present in syconoid sponges, e.g. Scypha.

1. In which, body wall is secondarily folded to form incurrent and radial canals. It opens into the spongocoel by an opening called apopyle. Both types of canals are interconnected by minute pores called prosopyles.

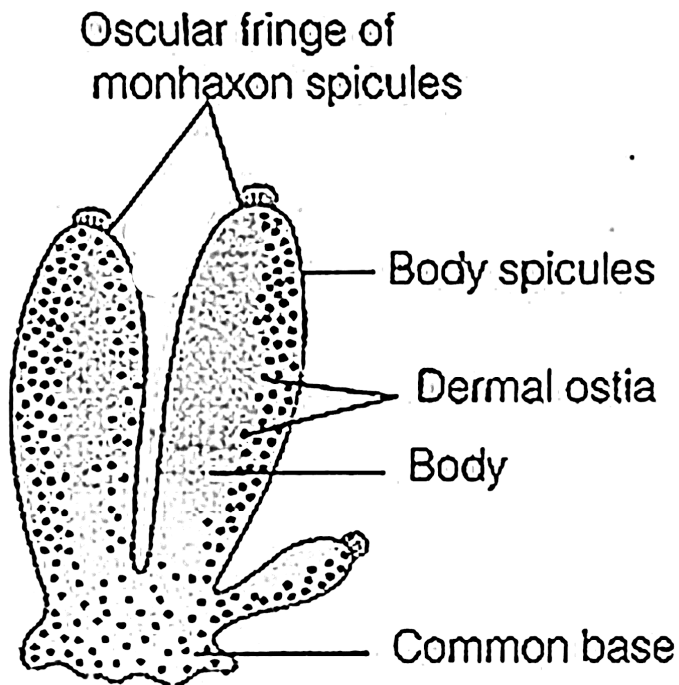
2. Incurrent pores or ostia are found on the outer surface of body and open into the incurrent canals, which lead into adjacent radial canals through minute openings called prosopyles.

3. Radial canals are the flagellated chambers. It opens into central spongocoel by internal openings called apopyles.

4. Spongocoel is a narrow, without flagellated cells but is lined by pinacocytes and opens to exterior through the osculum.



Sycon type canal system (Ex: Scypha)

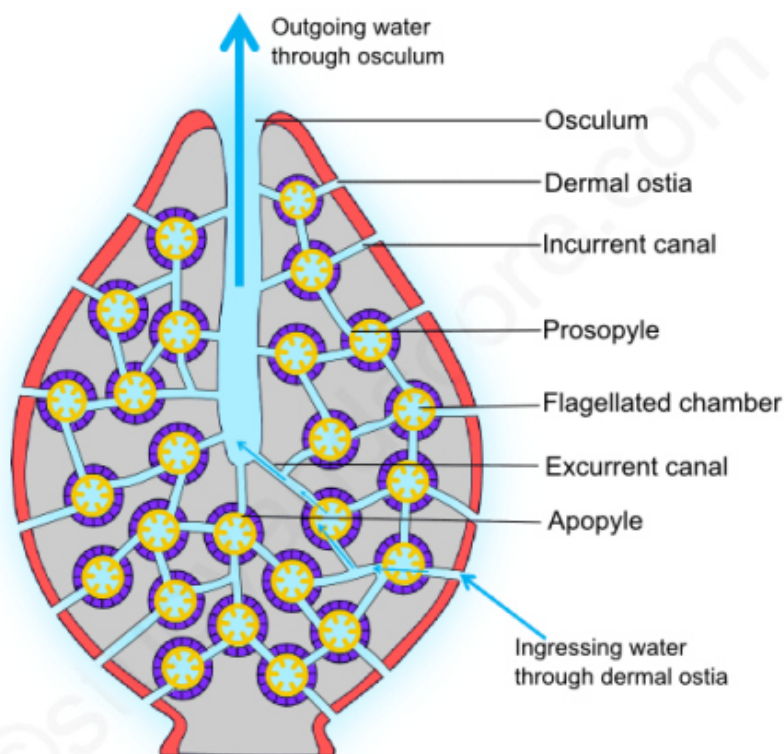


3. LEUCON TYPE CANAL SYSTEM: This type is a characteristic feature of the leuconoid sponges e.g., Spongilla.

1. In this type, the radial canals get separated into small rounded or oval flagellated chambers by further folding of the body wall. Incurrent canals open into flagellated chambers through prosopyles. Flagellated chambers, in their turn, communicate with excurrent canals through apopyles.

2. Excurrent canals are formed as a result of division of spongocoel. It has almost disappeared in these sponges. Thus excurrent canals communicate with the outside through a small spongocoel and an osculum.

3. This type of canal system has varying degree of complexity of canals. Further it can be classified into three types: Eurypylous type (E.g. Plakina), Aphodal type (E.g. Geodia) and Diplodal type (E.g., Spongilla and Oscarella).



Leucon type canal system (Ex: Spongilla)

Classification The phylum Porifera has four classes, namely the Calcarea, Demospongiae, Hexactinellida and Homoscleromorpha.

Class Calcarea: Calcareous sponges have a mineral skeleton composed entirely of calcium carbonate, exclusively marine, calcareous sponges predominantly inhabit shallow tropical waters. They are often small and delicate, with thin coalescent tubes or a vase-like form. . Most of the species are white or cream, but some species may be also red, yellow or pink.

Class Demospongiae: Demospongiae is the largest and most diverse class of the Porifera, it is found in marine and freshwater environments.

Class Hexactinellida Also known as glass sponges; exclusively marine and largely restricted to both hard and soft substrates in deeper environments (beyond 400 m).

Class Homoscleromorpha Small group of marine sponges inhabiting predominantly shallow environments, often found in dark or semi-dark ecosystems.