

CANAL SYSTEM IN SPONGES

The body of sponges is traversed by numerous canals opening to the outside by many minute pores. These canals and pores of sponges constitute the canal system.

The canal system creates a water current to flow in and out of the sponge continuously and play an important role in the physiology of sponges.

Types of Canal System.

There are four types of canal system in sponges. They are as follows:

1. Ascon type
2. Sycon type
3. Rhagon type
4. Leucon type

1. Ascon type:

In this type of canal system, the animals are cylindrical in shape. The body wall contains many pores called ostia. These pores are intracellular because each pore is formed by the perforation of a single cell called poroocyte. All the ostia open into the central cavity called spongocoel which is lined by choanocytes. These spongocoel open into to the outside at the free end by a circular opening called osculum.

The beating of the flagella of the choanocytes creates a water current. The water flows in its following route:

Ostia → Spongocoel → Osculum → outside.

[Fig]

2. Sycon type:

This type of canal system is of two types. They are 1. Sycon type without cortex and 2. Sycon with cortex.

~~Fig 1~~ ~~System type without cortex~~ (2)

It is found in Sycon. It is derived from the Ascon type by the development of many finger-like outgrowth called radial canals. These radial canals are lined by choanocytes. But the spongocoel are lined by ectoderm.

Between the radial canals there is another canals called incurrent canal. The incurrent canals are open into the radial canals by minute pores called prosopyles. The radial canals open into spongocoel by a opening called apopyle. The spongocoel opens outside by the osculum. The water flows through the following routes:

Ostia → Incurrent canal → Prosopyle → Radial canal → Apopyle
→ Spongocoel → Osculum → outside
A. ↑

Fig 1

2. Sycon type with cortex:

This type of canal system is found in Sycon. In addition to previous type it has following additional features. The pores as follows:

1. The epidermis and mesenchyme spread over the outer surface so as to form a cortex.
2. The free end of incurrent canal open to the outside by minute pores called dermal ostia.
3. The incurrent canal opens into the radial canal by opening called prosopyle.
4. The radial canal opens into the spongocoel by opening called apopyle.

The water current flows as follows:

Dermal ostia → Incurrent canal → prosopyle
→ Radial canal → Apopyle → Spongocoel → osculum.

3. Rhagon type: This type of canal system found in Rhagon, a larval form of Spongilla.

CANAL SYSTEM IN SPONGES

(5)

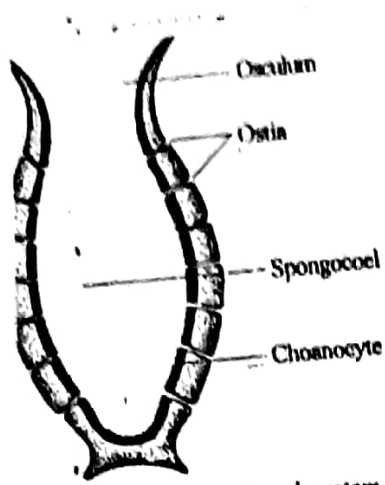


Fig. 3.38: Ascon type of canal system.

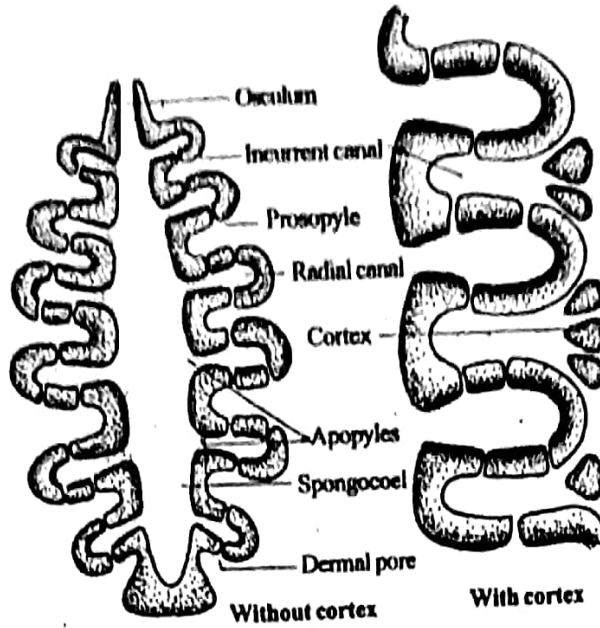


Fig. 3.39: Sycon type of canal system.

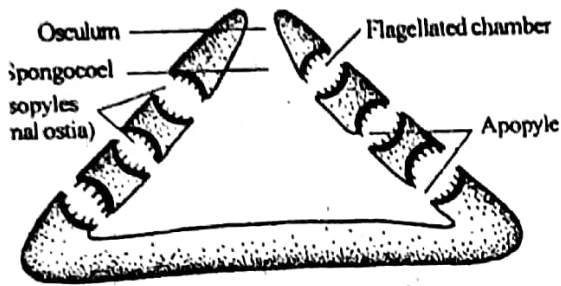


Fig. 3.40: Rhagon type of canal system.

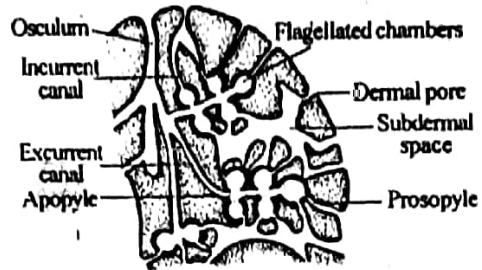


Fig. 3.41: Fuirnholous type of canal system.

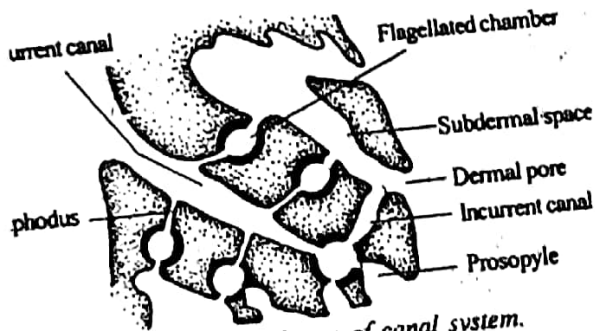


Fig. 3.42: Aphodal type of canal system.

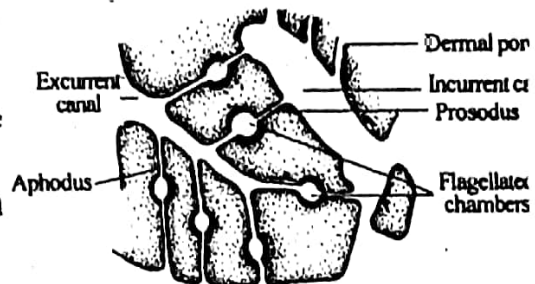


Fig. 3.43: Diphodal type of canal system.

The ^{the} ~~the~~ ^{trigone} is conical in shape. The radial canal is in the form of rounded chambers called flagellated chambers. The flagellated chambers open to the outside by dermal ostia or prosopyles and they open into the spongocoel by opening called apopyle. The spongocoel open to the outside by osculum.

The water current takes the following route:

Dermal ostia → Prosopyle → Flagellated chamber
 → Apopyle → Spongocoel → Osculum.

Fig

4. Leucon type.

This type of canal system derived from ~~trigone~~ ^{trigone} type. The leucon type has the following advanced characters:

1. The dermal ostia open into the subdermal ~~space~~ ^{space} which opens into incurrent canal.

2. Incurrent canal open into flagellated chamber which open into the excurrent canal.

3. Excurrent canal open into the spongocoel which opens outside by osculum.

The leucon type of canal system is of three types:

1. Euryphyllous type
2. Apical
3. Diploclad

1. Euryphyllous type: Ex. Tetilla, Plekotis etc.

This type of canal system has following features:

1) The flagellated incurrent canal opens into the flagellated chamber by the opening called prosopyle.

2) The flagellated chambers are arranged in clusters.

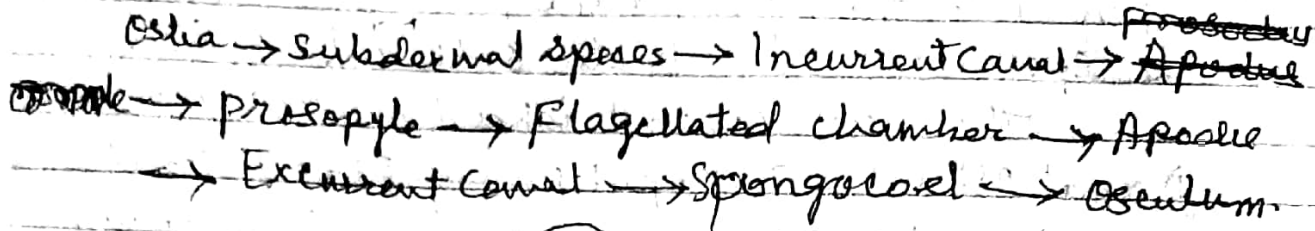
3) The flagellated chambers opens into excurrent canal by an opening called apopyle.

4) The current of water takes following route

Dermal pore → Subdermal space → Incurrent canal
 → Prosopyle → Flagellated chamber → Apopyle
 → Excurrent canal → Spongocoel → Osculum.

④ 2. Apodal type: Ex- Geodia, Stellata etc.

In this type of Canal system the flagellated chambers open into excurrent canal through a canal called apodus. The water current flows as follows:

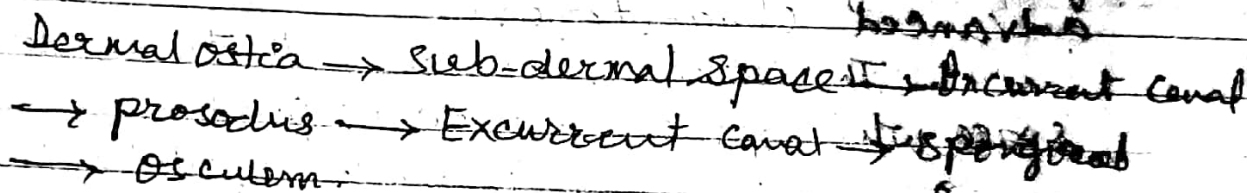


(Fig)

(Fig)

3. Dipodal type: Example Spongilla, ^{oscarella etc.} ~~oscilla~~

In this type incurrent canal opens into the flagellated chamber through a canal called inopodus.



(Fig)

Function of Canal system:

The Canal system has following important functions:

- ① Respiration: The cells absorb O_2 from the water current and give out CO_2 .
- ② Nutrition: The water current brings in food particles.
- ③ Excretion: Nitrogenous waste products and faeces are washed out by the water current.
- ④ Reproduction: The water current carries the sperms from one sponge to other sponge.

dy
an