(102CR-1.3) CANAL SYSTEM IN SPONGES

All the body cavities traversed by water currents, nourishing the sponge from the time it enters by the pores until it passes out by the osculum, are collectively referred to as canal system. Thus canal system is a system of inter communicating cavities bathed by the currents of water that aids the sponges to carry out vital life processes like nutrition , respiration, excretion, reproduction etc. It is found in simplest form in *Olynthus,* but in others it has attained varied degree of complexity where the collared cells (Choanocytes) are restricted to certain regions. Three main types of canal systems in the order of increasing complexity are **asconoid, syconoid and leuconoid** (2).

Asconoid Canal System

This type of canal system occurs in only a very few sponges like *Leucosolenia* which are small in size having vase like radially symmetrical body. It is a simplest type of canal system with the following salient features:

- The body wall is thin walled and unfolded with poorly developed mesenchyme.
- There are numerous intra cellular perforations in the body wall the **ostia or incurrent pores** which pass through **porocytes** into spongocoel**.**
- The spongocoel which opens outside by single terminal osculum is lined all over by choanocytes.
- The route followed by the water currents is ostia, spongocoel and osculum.

Syconoid Canal System

This type of canal system is slightly complicated and advanced than asconoid one with following important features:

- The body wall of the sponge is thick and folded with well developed mesenchyme.
- The radial canals that are formed by out pushing of body wall are lined by choanocytes hence better called flagellated canals.
- The incurrent canals with epidermal lining formed between radial canals open to the exterior through dermal ostia and into the radial canals through prosopyles.
- The radial canals open into spongocoel by internal ostia.
- This type of canal system is found in Sycon,Sycetta,Grantia etc.

Leuconoid Canal System

It is the complex type of canal system which in calcarious sponges is attained through modification of asconoid and syconoid stages and has following features:

- The mesenchyme forms extensive dermal and gastral cortex resulting thickening of sponge wall
- The ostia lead into incurrent canals which are irregular and often branched.
- The spongocoel is either narrow or lacking.
- The radial canals are folded to form flagellated chambers.
- The flagellated chambers lead into excurrent canals that eitheropen into spongocoel or outside through osculum.
- There are four types of variations presented by leuconoid type of canal system viz. **Eurypylous, Prosodal, Aphodal and Diplodal** (1)
- This type of canal system is found in *Leucilla,Geodia,Oscarella, Spongilla* etc.

In demospongia leuconoid canal system is derived from a simple canal system found in **rhagon larva.** So this type of canal system is called rhagon canal system.The salient features of this type are:

- The sponge body is conical in shape with basal wall the hypophere devoid of flagellated chambers and upper wall the spongophare containing flagellated chambers.
- The thick mesenchyme is traversed by incurrent canals and subdermal spaces.
- The incurrent canals open into small flagellated chambers which inturn open into wide spongocoel through excurrent canals.The spongocoel opens outside through osculum.

Functions

Canal system helps the sponge in:
Nutrition
Respiration
Excretion
Reproduction etc.

References

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