

"Canal System in Porifera"

All the cavities of the sponges are traversed (to cross over) by the current of water which nourish the sponge, from the time they enter by the pores, until they pass out by the osculum, are termed collectively "Canal System". There are mainly four types of Canal Systems.

- ① Aseon type
- ② Sycon type
- ③ Leucon type
- ④ Rhagon type

① "Aseon type"

It is the simplest type of canal system found in the sponges. It is represented in the development of simple calcareous sponge clathrin. It is hollow vase shaped and is usually attached with the substratum through a narrow stalk like base. The body wall is thin and is composed of an outer ectoderm of a thin layer of flat cells - the pinacocytes, an inner endoderm of choanocytes and an intermediate mesogloea. It is perforated by many small apertures the ostia. It encloses a very large cavity the spongocoel which opens outside through a narrow circular aperture situated at the distal end. The body wall being very thin, the ostia directly open into the spongocoel. The water current enters the spongocoel through the ostia and leaves it through apophyses. osculum.

Collar cells or

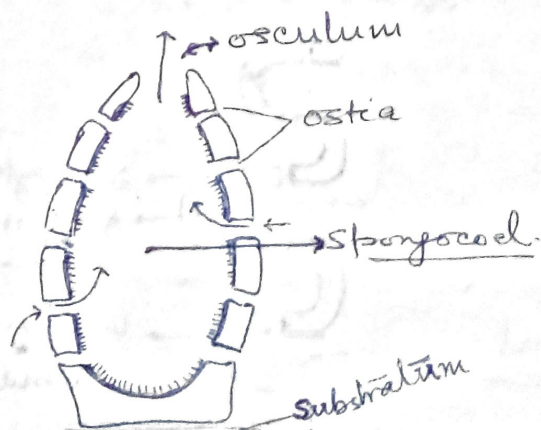


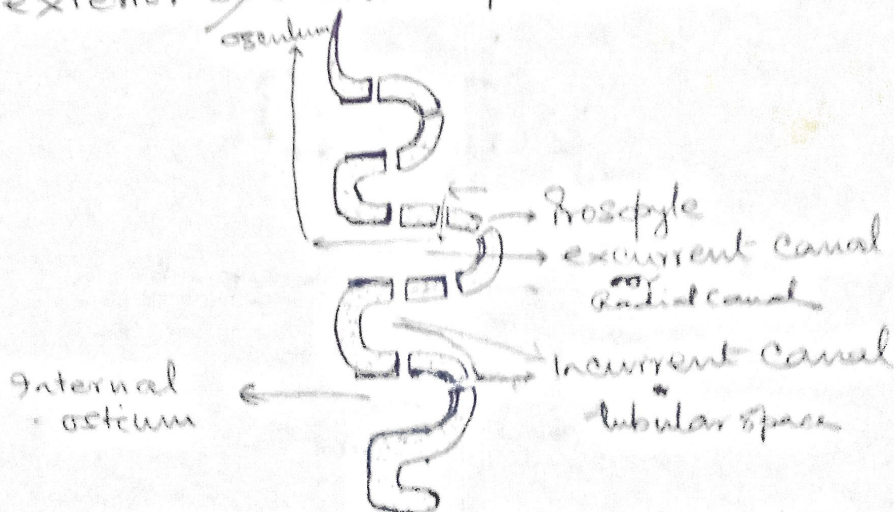
Fig. → Leucosolenia L.S. (diagrammatic) of a single tube showing Aseonoid type of canal system.

The asconoid Canal System is also found in Leucosolenia. A slightly more complicated structure is found in thick walled sponges. In this case the body wall becomes somewhat folded and radial canals which in its turn open into the spongocoel through apertures. The spongocoel and radial canals are lined by choanocytes.

water currents take the following route
 water → pores → spongocoel → osculum → outside

(2) "Syconoid type"

A more complicated type of canal system is found in many sponges. Theoretically it is formed from ascon type by unequal growth and by the consequent folding of the body wall. Thus by the outpushing of the wall of the asconoid sponge, several blind diverticulae are formed of the spongocoel. These projections or diverticulae form radial canals or excurrent canals. In some forms of sponges, these radial canals are surrounded by water directly and there are no incurrent canals. But in some syconoid sponges, tubular spaces called incurrent canals are formed. Thus, these incurrent canals are the outer spaces enclosed between folds of the body-wall and lined by outer epidermis. These incurrent canals open to the exterior by dermal pores or ostia.



Syconoid type of Canal System

The radial canals are provided with choanocytes or flagellated collared cells. Therefore, these are also called flagellated canals. The internal openings of the radial canals into spongocoel are called internal ostia. Spongocoel opens to the exterior by an opening, called osculum, as in ascoid type of canal system.

The walls between incurrent canals and radial canals are perforated by numerous pores, which are intercellular spaces and not the channels, called prosopyles.

In the mesenchyme of syconoid sponges is situated a skeleton, made up of spicules.

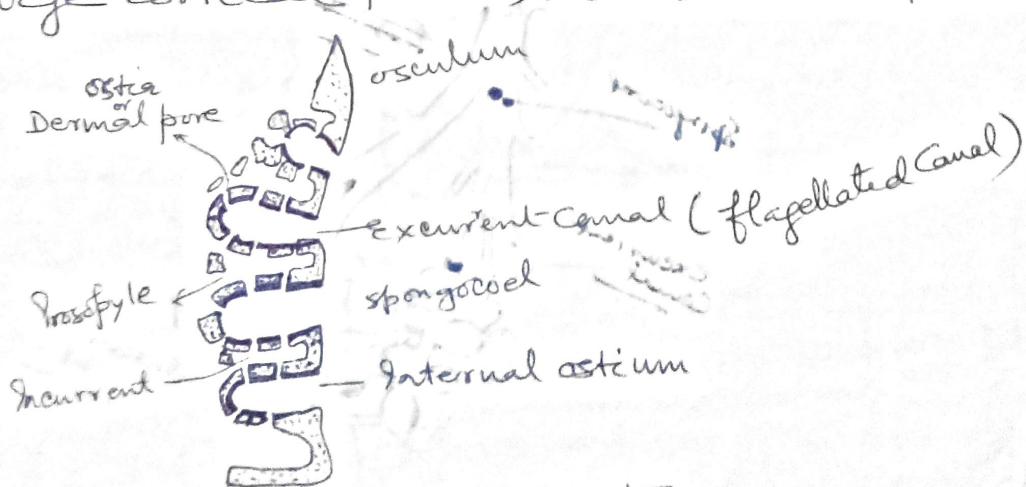
The important points of differentiation of the Sycon type from that of Ascoid type

- ① In the Syconoid type, thick, folded-wall having incurrent canals and radial canal is present.
- ② In Syconoid type choanocytes are not continuous but are found only in the radial canals.

Syconoid type of canal system consists of two stages: →

① The type as found in Sycon, where the internal surface consists of blind outer end of radial canals with spaces between them serving as dermal ostia.

② In the 2nd stage the epidermis and mesenchyme spread over the outer surface so as to form a thick cortex, containing cortical spicules. Epidermis is perforated by definite pores, which lead into incurrent canals, that take irregular course through the cortex, ultimately reaching outer ends of flagellated chambers or may form large cortical spaces, the subdermal spaces.



Syconoid type of canal system with cortex.