

NON CHORDATA PART I

I Semester B.Sc. Zoology Core Course I

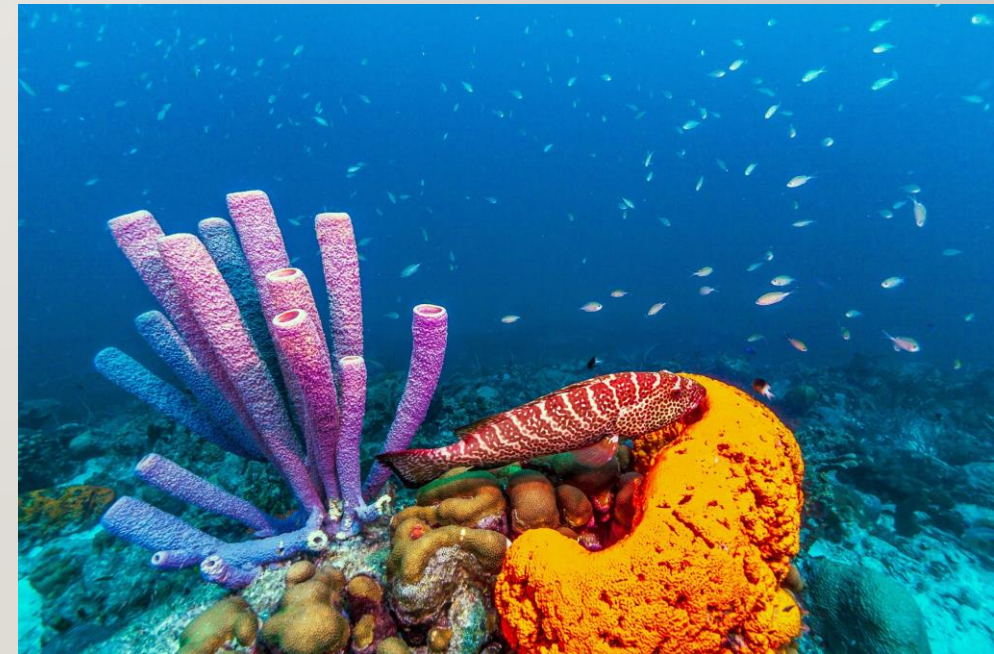
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PHYLUM PORIFERA



INTRODUCTION

- Porifera includes the animals commonly called sponges or pore-bearers.
- *Asymmetrical or radially symmetrical metazoans, with cellular grade of organization, porous body and an internal system of canals.*



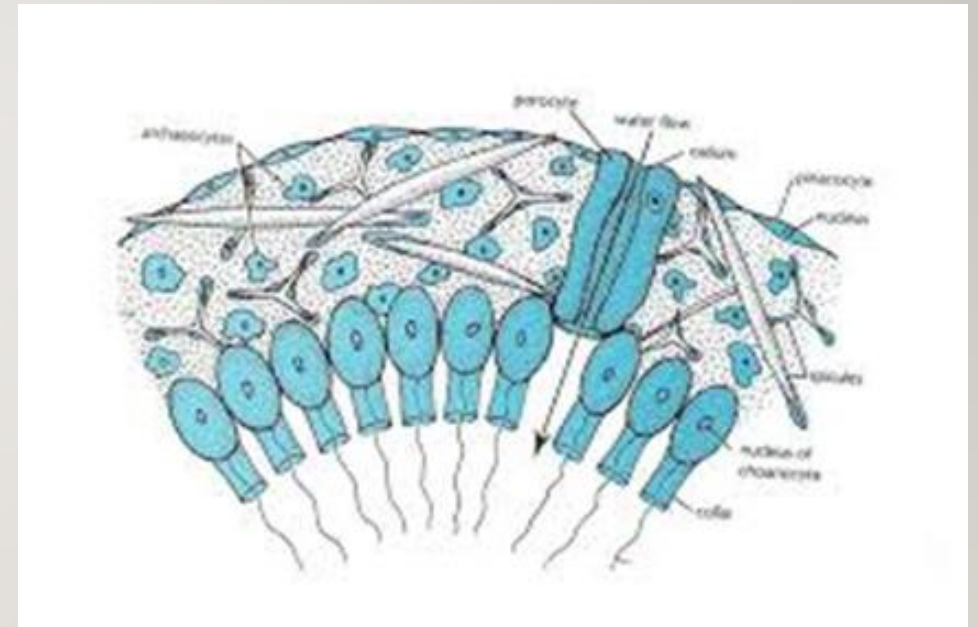
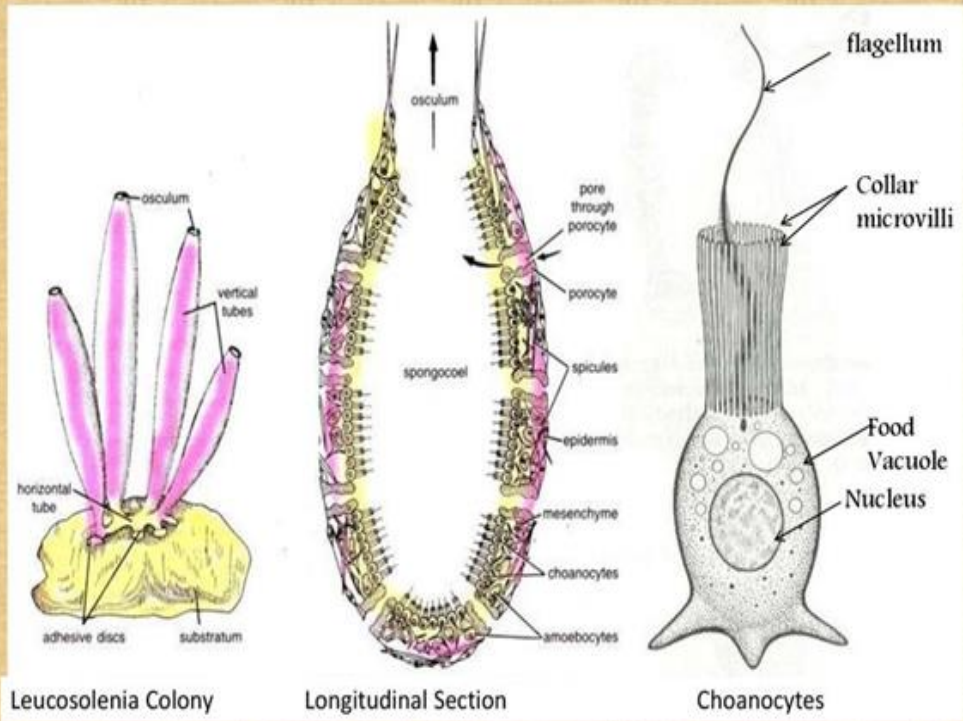
SALIENT FEATURES

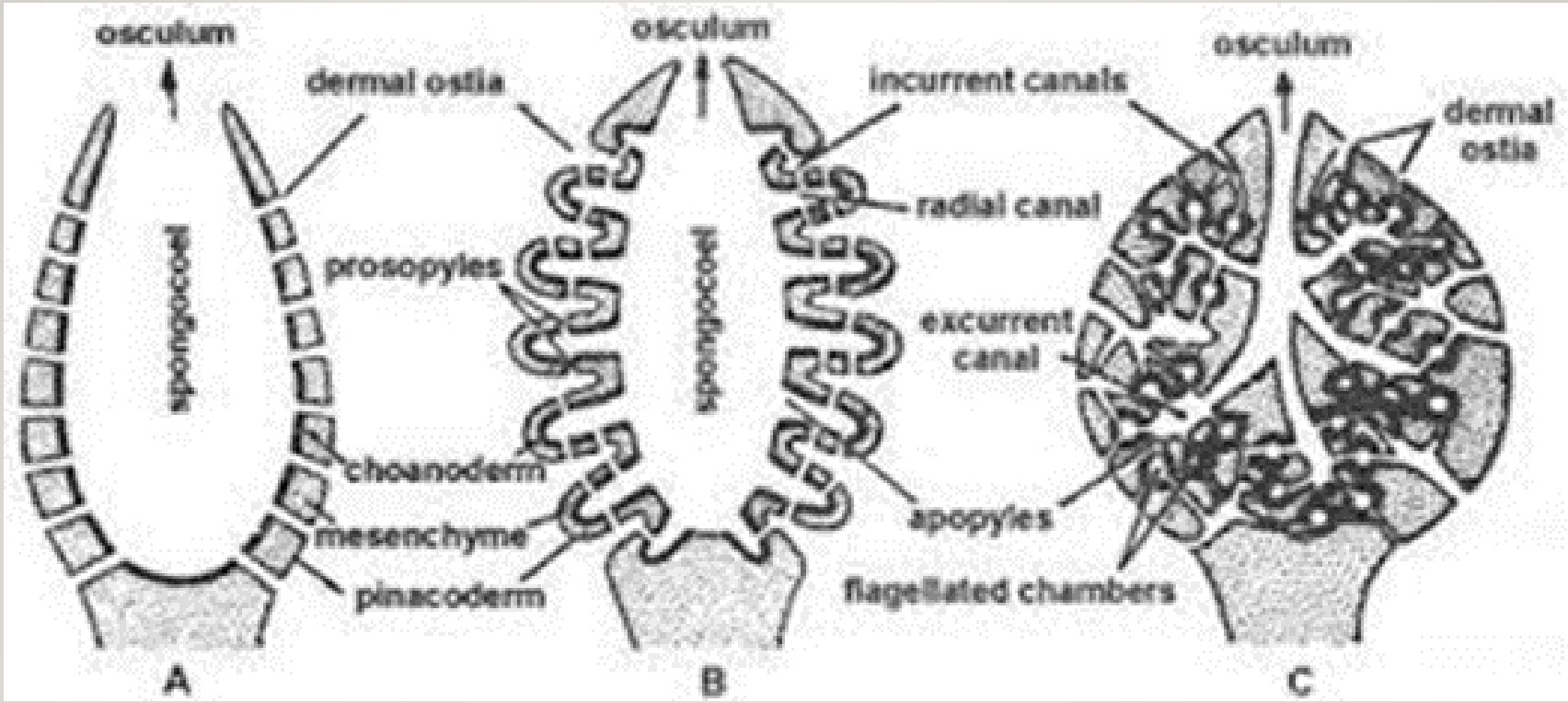
- *Cellular grade of organization*: The body of sponges is formed of only loose aggregations of cells, without tissues and organs.
- *Porous body*: Body is perforated by numerous openings, called *ostia* or *incurrent pores*, for the inflow of water. The phylum gets its name from this feature (L. *porus* = opening, *ferre* = to bear).
- *Internal canal system*: Internally, there is an elaborate system of canals for the circulation of water and the transport of food and oxygen.
- *Presence of spongocoel or paragastric cavity*: Body encloses a central cavity, called spongocoel. **Ostia** open to this from outside. Spongocoel opens out by a large passage, known as **osculum**. Water enters the spongocoel through the ostia and passes out through the osculum. Mouth and digestive system are absent.

SALIENT FEATURES

- *Presence of choanocytes:* Lining the spongocoel and the canal system are a unique type of flagellated and collared cells, called choanocytes. These are similar to the protists choanoflagellates.
- *Body is supported by spicules and spongin fibres:* The body wall of sponges consists of a gelatinous matrix, supported by *spongin fibres* and *spicules*. Spongin is a silk-like and elastic substance. Spicules are small bristles, formed of silica or calcium carbonate.
- Very high powers for regeneration (power to repair or reconstruct damaged or lost parts).

The Sponges - Leucosolenia





SALIENT FEATURES

- *Reproduction is both asexual and sexual: Asexual reproduction is by fragmentation and budding. Sexual reproduction involves a flagellated and free-swimming larva (e.g., Parenchymula, Amphiblastula).*
- Sponges are all sessile, aquatic organisms. Most of them are marine, but a few are freshwater forms.
- More than 5,000 species of sponges are now known. It is believed that sponges evolved as an early offshoot from the main line of metazoan evolution, probably in the late pre-Cambrian.

CLASSIFICATION OF PORIFERA

- Phylum Porifera is divided into three classes, based largely upon the chemical composition and structure of the supporting skeleton.
- The classes are *Calcispongiae* or *Calcarea*, *Demospongiae* and *Hyalospongiae* or *Hexactinellida*.

CLASS - CALCISPONGIAE (CALCAREA)

- Calcispongiae includes the sponges, commonly called calcareous sponges, since their spicules are formed entirely of calcium carbonate.
- They are the most primitive of all sponges and are inhabitants of the shallow coastal waters of the seas all over the world.

SALIENT FEATURES

- Members are small-sized, simple and solitary or colonial.
- Body is cylindrical or vase-like.
- Spicules are *monaxonic* (single-rayed) or *tetraxonic* (four-rayed) and are formed entirely of calcium carbonate.
- Osculum is often fringed with bristles.
- Choanocytes are relatively large.
- *Examples: Leucosolenia, Leucandra, Grantia, Sycon (= Scypha).*

LEUCOSOLENIA



CLASS - DEMOSPONGIAE

- Demospongiae is the largest group of sponges.
- It includes nearly 80% of the sponge species.
- Its members are the most widely distributed and the most highly organized of all sponges.
- They are large-sized and solitary or colonial.
- With the exception of the family *Spongillidae*, all members are marine.

CLASS - DEMOSPONGIAE

- Compact, mostly massive and brightly coloured body.
- The supporting spicules and fibres are formed of spongin and / or silica, but never of CaCo, Spicules are monaronic or tetraronic, and are differentiated into large *megascleres* and small *microscleres*. In some forms, skeleton is absent.
- Spongocoel is practically absent.
- Presence of contractile vacuole in fresh water species, a feature found in fresh water protozoans.
- Examples: *Spongilla*, *Cliona*, *Oscarella*, *Euspongia*

SPONGILLA



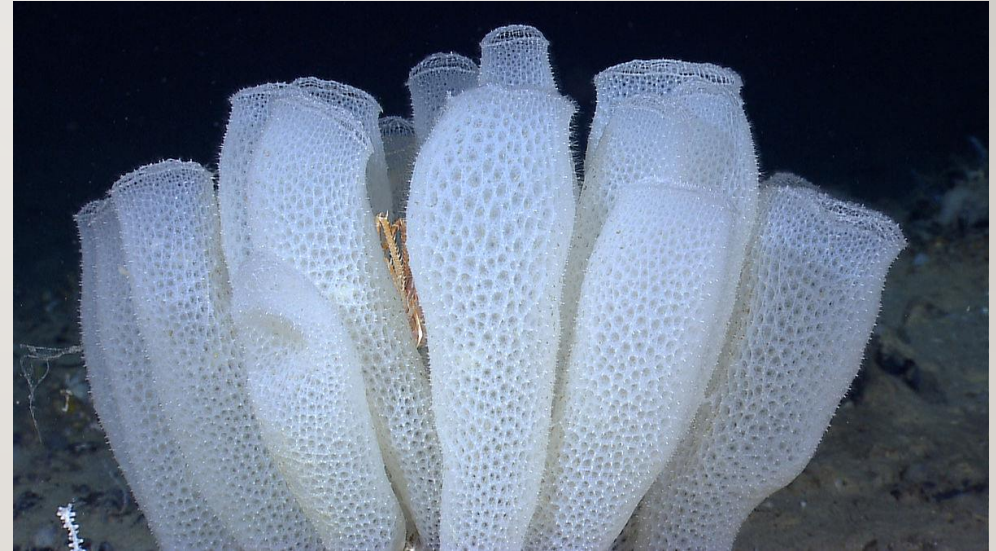
CLASS - HYALOSPONGIAE (HEXACTINELLIDA)

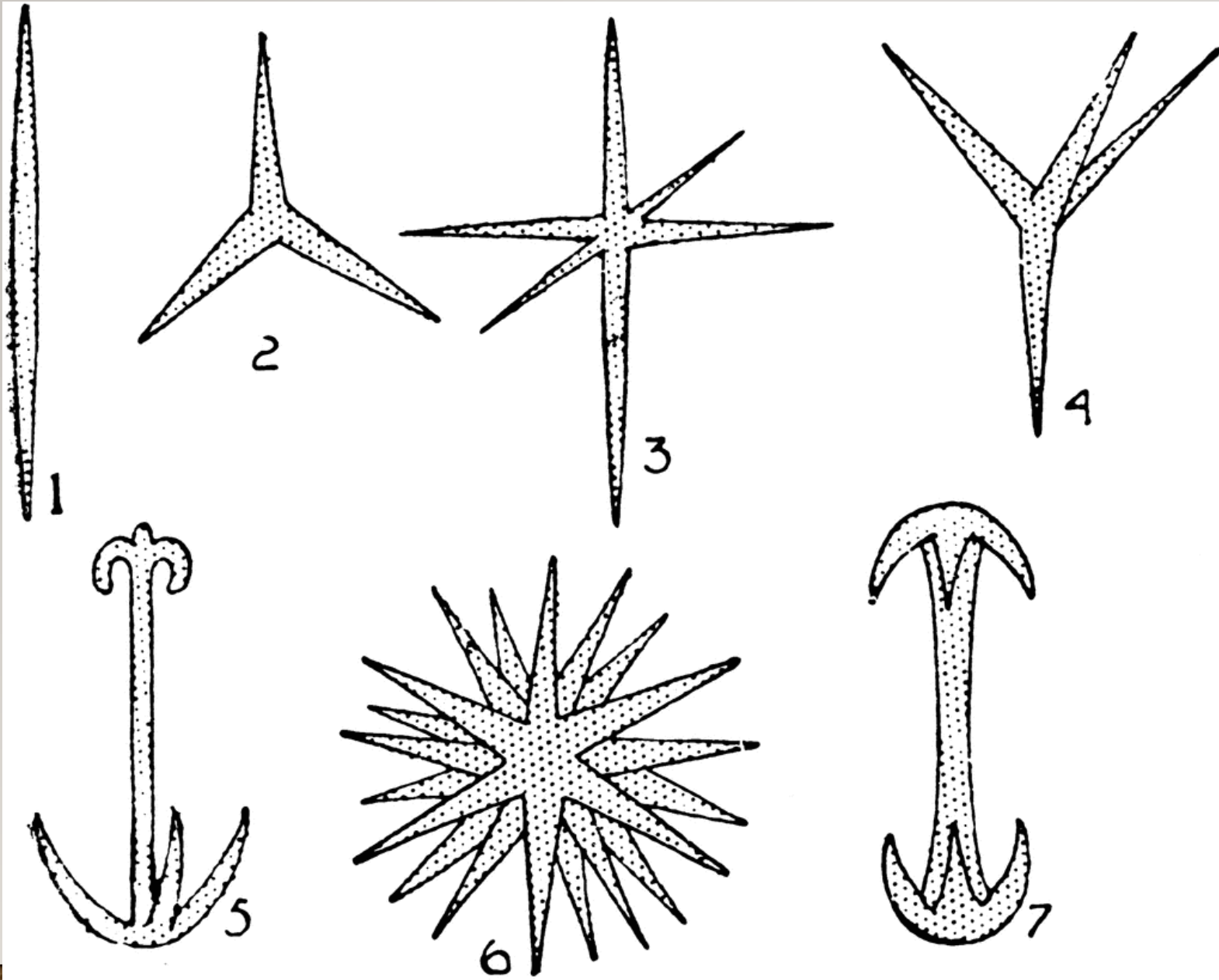
- Hyalospongiae includes the sponges, commonly called "glass sponges," since their skeleton is some what glassy.
- They are mostly deep sea forms, living in the dark and cold abyssal depths.

CLASS - HYALOSPONGIAE

- Solitary forms with cylindrical or funnel-shaped body having marvellous asymmetry and structural complexity.
- The outer layer and the inner flagellated layer of the body wall are syncytial rather than cellular.
- Contractile elements are absent in the body wall.
- Glass-like silicious skeleton, formed mostly of *hexaxonic* (six-rayed) spicules (hence the name "hexactinelliada"). In some cases, the spicule fuse to form a lattice-like skeleton.
- Simple canal system.
- *Examples: Euplectella, Hyalonema, Pheronema.*

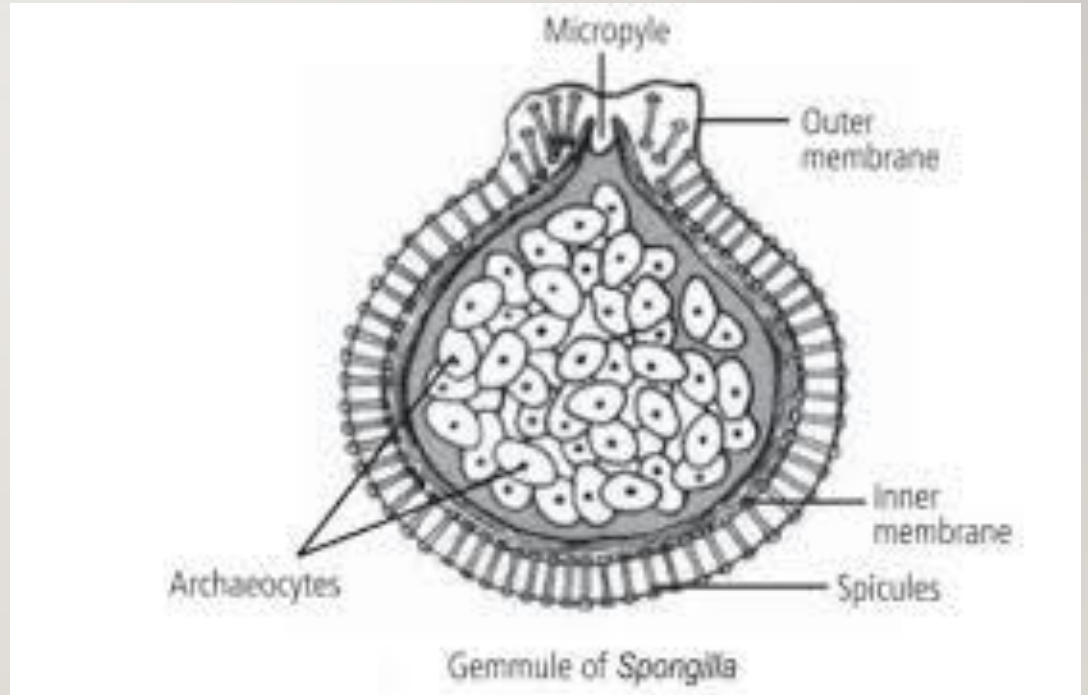
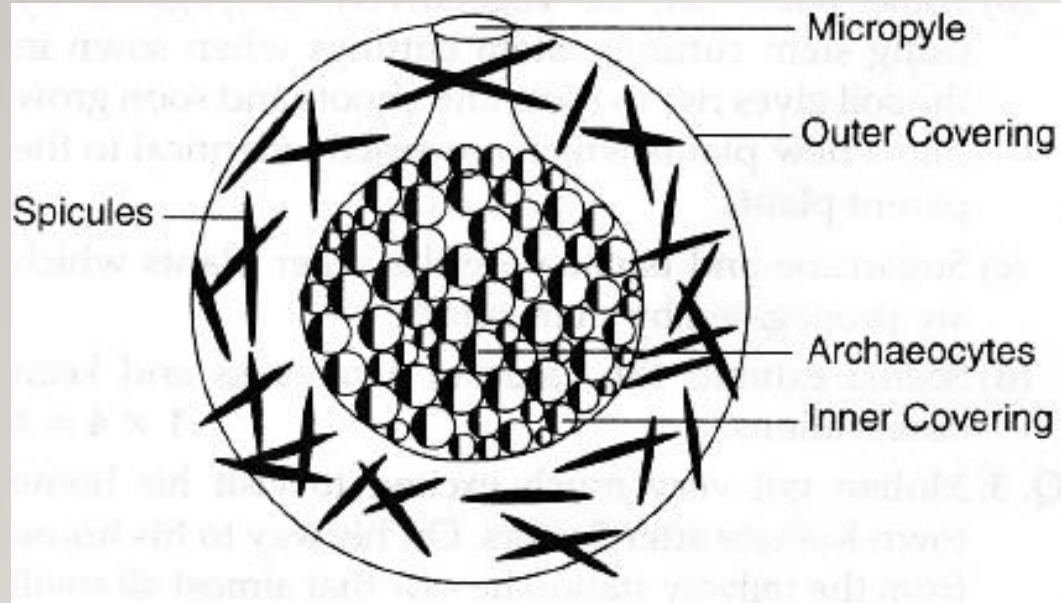
EUPLECTELLA



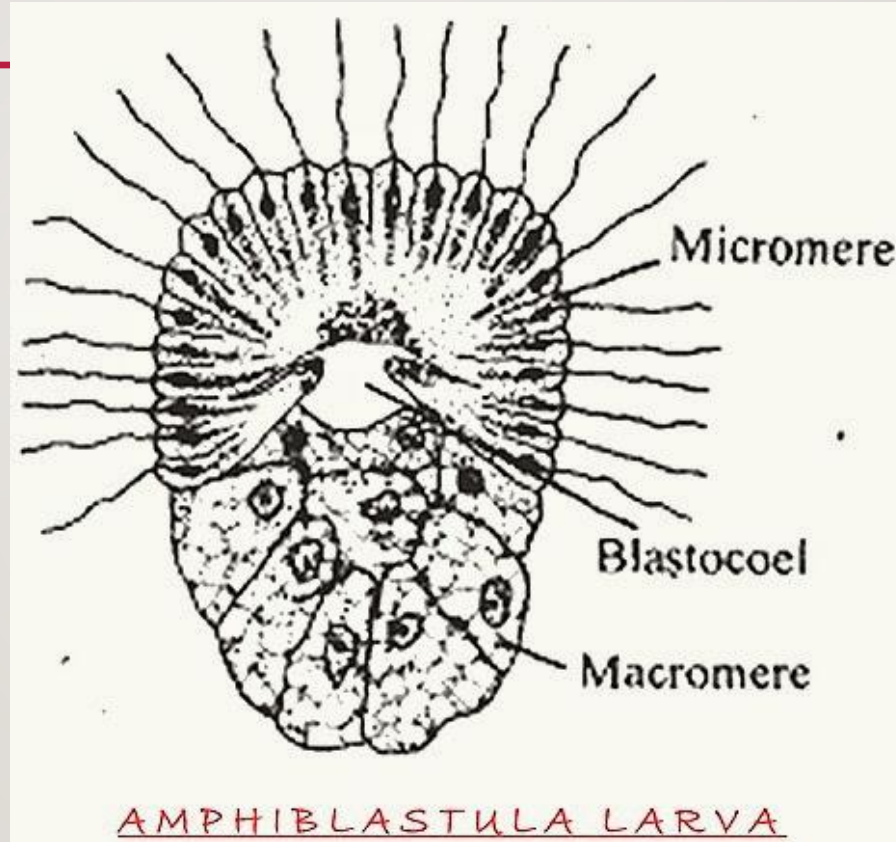


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1. MONAXON
 2. TRIOD
 3. HEXAXONIC
 4. TETRAXON
 5. ANCHOR
 6. POLYAXON
 7. A KIND OF AMPHIDISC

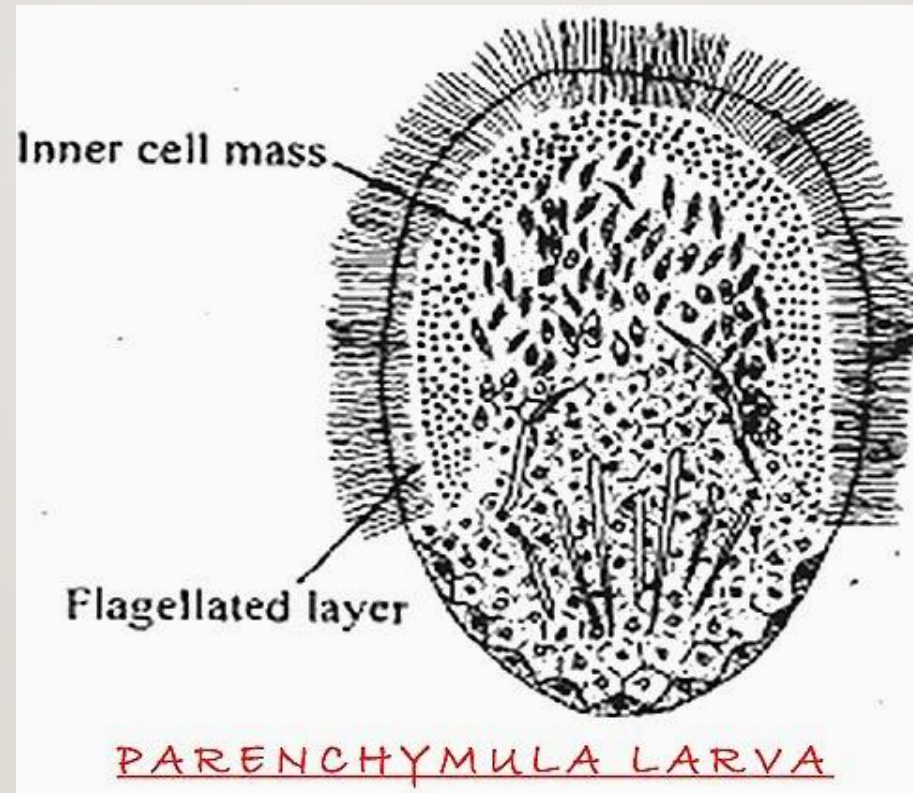
GEMMULE



AMPHIBLASTULA



PARENCHYMULA





THANK YOU

