PHYLUM : PORIFERA &
(Gl's classification)

INTRODUCTION

Sponges, which constitute the phylum "Porifera", are the most primitive of the multicellular animals. Neither true tissues nor organs are found & the cells display a considerable degree of independance. Hence their body exhibit the "cellular grade of organisation".

All members of the phylum are sessile & exhibit little detectable movement. This combination of characteristics convinced Aristotle, Pliny & other ancient naturalists that sponges were plants. But it was not until 1765 when internal water currents were 1st observed & the animal nature of sponges became clearly established.

This phylum includes pore bearing animals (L., porus = pore; ferre = to bear) which are exclusively marine except the members of the Spongillidae family. Here the multicellular but cellular grade of organisation of these sponges. This gr. has been given the status of "Parazoan".

DISTINGUISHED CHARACTERS

This phylum carries the following distinguished characters :⇒

(i) Except the only family, "Spongillae", all are marine.

(ii) Most sponges exhibit the radial symmetry.

(iii) Multicellular & diploblastic & non-cellular mesohyl in betⁿ ecto- & endoderm.

(iv) Entire body & surface ramified & pores & elaborated & canal systems.

(v) Outer surface lined & "Pinacocytes" & int. surfaces lined & fl. collar cells. Hence, the finger like projections are known as "Flagellated Radial canals".

(vi) Total loss of appendages.

(vii) Body shows "Cellular Grade" of organisations.

(VIII) skeleton of spongin fibres & spicules.

(IX) Reproduction takes place both asexually via "gemmule formation" & sexually by gamete formation.

Initially, Aristotle (284-322 B.C.) regarded sponges animals even knowing their resemblances ∈ plants. Their animal nature was studied only in 1765, but their place in the ani. kingdom was uncertain till 1857. Ellis (1765) 1st noticed the water current streaming in & out of sponges showing their ani. nature. It was not until 183 when R. Grant called these sponges as animals.

CLASSIFICATION

A/O, PARKER & HASWELL (1967), this phylum has only one class of the same name. & classified it into following sub-classes: →

1. Calcarea
2. Hexactinellida
3. Desmospongia.

Here, the following classifn is based according to the classifn. proposed by Robert D. Barnes (1975) who classified this phylum into 3-classes as follows: →

I. Calcarea / Calcispongiae
II. Hexactinellida / Hyalospongiae
III. Desmospongiae.

I. Class: Calcarea: (L., calcarius = limy)

i) Members of this class are known as "Calcareous Sponges" & are distinctive in having spicules composed of cal. carbonate ($CaCO_3$).

ii) Spicules are monaxons, or 3 or 4 pronged types & are usually separate.

iii) All the three grades of str — asconoid, syconoid & leuconoid are encountered.

(IV) relatively restricted to shallow coastal waters of oceans.

Ex— Leucosolenia & Sycon.

II. Class: Hexactinellida: (Gr., Hex = six; actions = ray

I) The name, Hexactinellid is derived from the fact that the spicules are always of the triaxon or 6-pointed type.

II) Some of the spicules often fuse to form a skeleton that may be lattice like & built of siliceous ~~spicules~~ fibres. Hence, they're known as "Glass sponges" + nt.

III) Flagellated canal are ~~arranged~~ radially & in parallel planes, ie, syconoid in str.

IV) No epidermis of pinacocytes, instead covered by a netlike syncytium.

V) Includes chiefly ~~leuconoid~~ deep water sponges.
Ex — Hyalonema, Euplectella.

III. Class: Demospongiae: (Gr., demos = people; spongos = sponge)

I) Includes greatest no. of sponge sps. & includes ~~most of the~~ common & familiar North American sponges.

II) Mostly marine & range in distribution from shallow to great depths.

III) skeleton of this class is variable. It may consist of Siliceous spicules or spongin fibres or a combination of both.

IV) All are leuconoid & majority are irregular

V) Brilliant colours due to pigment granules + nt in amoebocytes.

VI) The family "Spongillidae" contains ~~majority~~ most fresh water sps.

Ex — Potericri, Spongilla etc.

IV. Class: Sclerospongiae:

I) This 4th Class of the phylum ~~are~~ been proposed by Hartman & Goreau (1970). & in this class, they placed 6 sps. of corallines sponges

II) These are leuconoid sponges.

III) Int. skeleton of sil. spicules & spongin fibres & an outer encasement of $CaCO_3$.

IV) Numerous oscula having star like configuration.

FURTHER CLASSIFICATION

HYMAN (1940) divided this phylum into 3-classes & further classified them into orders as follows: →

Class: Calcarea: It includes 2-orders: →

a. Homocoela &
b. Heterocoela

ⓐ **Order: Homocoela**

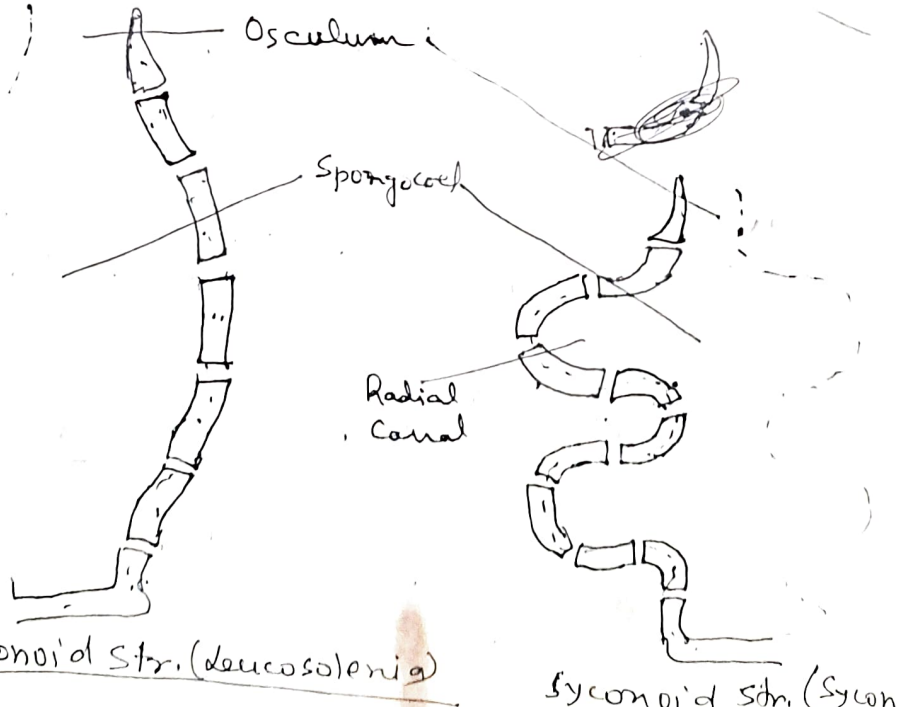
- Body wall not folded internally, i.e., have flagellated chambers.
- simple or ascon type of canal system.

Ex – Leucosolenia

ⓑ **Order: Heterocoela:**

- B.W. folded internally giving finger like outpushings or radial canals.
- flagellated cells restricted to radial canals.
- exhibit syconoid or leuconoid structure.

Ex – Sycon



Asconoid Str. (Leucosolenia)

Syconoid Str. (Sycon)

CLASS: HEXACTINELLIDA:

According to her, this class is further divided into 2- orders: →