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AFFINITIES OF PORIFERA.

Q. Give an account of affinities of Porifera or Sponges.

Ans: The phylum Porifera contains most primitive of the multicellular animals, called Sponges. They are usually referred to as "Pore bearers" as their body wall contains tiny pores.

★ AFFINITIES:

Their wide distribution, large varieties and vast numbers have established the sponges as a successful group of animals. They show affinities with Metazoa & Protozoa.

* AFFINITIES WITH METAZOA :

A Sponge develops by the cleavage of a fertilized egg & its body is composed of numerous cells. It is therefore, definitely a multicellular animal as it shows affinities with metazoans (Multicellular animals).

** Resemblance with Metazoa :

Among metazoans, Coelenterates are the one which shows some superficial resemblance with porifera as follows:-

- ① Both are sedentary.
- ② Both are diploblastic & acoelomate.
- ③ Instead of mesoderm, a gelatinous Mesogloea is present between the body layers.
- ④ The Spongocoel of sponges can be compared with the gastrovascular cavity of coelenterates.
- ⑤ Both reproduce asexually & form colonies by budding.
- ⑥ Parenchymula of sponges (larva of sponge) resemble the planula of coelenterates.
- ⑦ Biochemical study shows the presence of almost same nucleic acids & amino acids as in metazoans.

** Differences with Metazoa :

Sponges differ from coelenterates as well as other metazoans in several important aspects:-

- ① In sponges the cells are far less specialized and interdependent than cells of metazoa.
- ② Tissue formation in sponges is restricted to the production of epithelia on free surface.
- ③ There are no _____ as in most of the higher animals.
- ④ The sponges are said to be diploblastic but the term is not strictly applicable because of the difference in the manner of development of both the body layers.
- ⑤ Sponges do not have an anterior end or head.
- ⑥ The principle opening is not exhalant in any metazoa, as in the osculum of sponges.
- ⑦ Sponges lack a true mouth.
- ⑧ The blastoporal end is aboral in porifera while oral in other radiate phyla.
- ⑨ The perforated body and water channels found in sponges are some of the unique features of sponges.
- ⑩ The stinging cells of coelenterata are lacking.
- ⑪ A proper digestive cavity does not occur in sponges.
- ⑫ The choanocytes, lining the flagellated chambers are peculiar to sponges.
- ⑬ There is no nervous system in sponges.

- ⑭ The development of sponges is most puzzling and difficult to interpret.

* AFFINITIES WITH PROTOZOA :

In some respects with colonial Protozoa, the sponges closely resemble.

** Resemblance with Protozoa :

Sponges resemble the colonial protozoa in the following characters:-

- ① Lack of organs and a digestive cavity.
- ② Digestion is intracellular.
- ③ Simplicity of the tissues.
- ④ Possession of Collared and amoeboid cells similar to those of colonial Choano flagellata.
- ⑤ The amphiblastula larva of syconoid Calcareous undergoes an invagination process similar to that occurring in the development of volvox.

** Differences with Protozoa :

Sponges differ from protozoa in following manners :-

- ① Sponges possess a Canal system.
- ② Characteristic skeleton present in sponges and lack in Protozoans.
- ③ Sponges are more complex than that of protozoans.
- ④ Presence of specialized cells such as Pinacocytes, choanocytes and pores.

★ CONCLUSION:

The Porifera certainly has not give rise to any of the other metazoan phyla. They are thus regarded as on a byroad of evolution instead of being on the direct line of evolution. They constitute a blind branch which is diverged from ~~the~~ main evolutionary series near the foot of the family tree & which gave rise to nothing but sponges. In spite of certain superficial resemblance, the sponges bear no real similarity to and probably no genetic affinities with Metazoa. To emphasize this factor the animal kingdom is often divided into ~~three~~ sub-kingdoms & the sponges are placed in the sub-kingdom Parazoa of the same rank or at part with the other two sub-kingdoms, Protozoa & Eumetazoa. The diagnostic characters of the Parazoa

as required by sponges are as follows:-

- ① Body as a loose aggregation of cells without definite tissue layers & organs.
- ② No definite form or symmetry.
- ③ No true gut, the only internal space in form of cavity, pores & canals.
- ④ Presence of flagellated collar cells or choanocytes.
- ⑤ Water current flowing into the canal system serves the function of nutrition, reproduction, respiration & excretion.
- ⑥ Skeletal elements isolated spicules.
- ⑦ Power of absolute regeneration.
- ⑧ Larval stage is a Parenchymula or amphiblastula.