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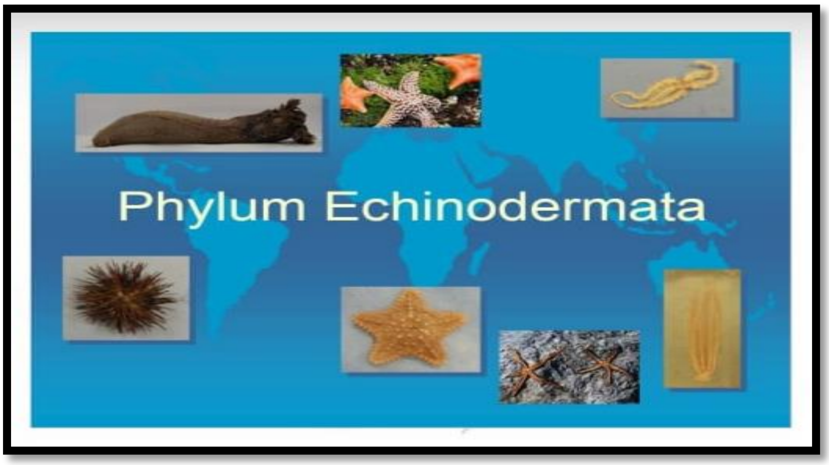
B.Sc. Part - I
Zoology (Hons.)
Paper – I- A.

PHYLUM : ECHINODERMATA



INTRODUCTION :

An echinoderm is a marine invertebrate of the phylum Echinodermata. Echinoderms are one of the most beautiful and most familiar sea creatures. **Examples of echinoderms are sea stars, sea lilies, feather stars, brittle stars, sea cucumbers, and sea urchins.** They are colourful organisms with unique shapes. They are ecologically and geologically very important.

For many years echinoderms and coelenterates were included as a class among Radiata, largely because of the radial symmetry of the adults. Echinodermata were first recognized as a group distinct from the Radiata by **Leukart in 1847. Echinodermata means "spiny**

skin” (Gr., echinos - hedgehog; derma - skin) **Echinoderms usually inhabit shallow coastal water.**

DEFINITION :

Echinoderms are exclusively marine and largely bottom dwellers enterocoelous coelomate, triploblastic animals. They have a pentamerous radial symmetry derived from an original bilateral symmetry. These are multicellular organisms with well-developed organ systems. The water vascular system present in echinoderms accounts for gaseous exchange, circulation of nutrients and waste elimination.

ECHINODERMATA: GENERAL CHARACTERISTICS

Phylum Echinodermata contains some 5300 known species and constitutes the only major group of deuterostome invertebrates. **Bather** (1900) stated the phylum as "one of the best characterised and most distinct phyla of the animal kingdom". Echinoderms are distinguished from all animals by a number of characteristics.

1. They have a star-like appearance and are spherical or elongated.
2. They are exclusively marine animals.
3. The organisms are spiny-skinned.
4. They exhibit Organ-system grade of body organization.

5. They are triploblastic, coelomate and radially symmetrical animals often pentamerous also.
6. Body unsegmented with globular, star-like, spherical, discoidal or elongated shape.

7. Head absent; body surface is marked by five symmetrically radiating areas (ambulacra) and five alternating interradii (inter-ambulacra).
8. They possess an endoskeleton of dermal calcareous ossicles with spines, covered by the epidermis.
9. A peculiar water-vascular system of coelomic origin, including podia or tube feet for locomotion and usually with a madreporite.
10. Coelom of enterocoelous type constitute the perivisceral cavity and cavity of the water vascular system.
11. Alimentary canal straight or coiled.
12. Vascular system and haemal system, enclosed in coelomic perihaemal channels.
13. Respiratory organs include dermal branchiae, tube feet, respiratory tree and bursae.
14. Nervous system without a brain and with a circumoral ring and radial nerves.
15. Poorly developed sense organs include tactile organs, chemoreceptors, terminal tentacles, photoreceptors and statocysts.
16. No excretory organs.
17. Usually dioecious, and fertilization is external.
18. Development indirect through free-swimming larval forms.