PHYLUM :: ECHINODERAMATA

GENERAL CHARACTERS

- The term Echinodermata was proposed by - **Jacob Klein**
- The term 'Echinodermata' means - **Spiny skin**
- EChinoderms with other invertebrates were placed under mollusca by - **Linneaus**
- Echinoderms with colenterata were included under Radiata by - **Lamarck**
- Echinoderms were identified as distinct taxon by -**Frey and Leuckart**
- Plylum in which all animals are exclusive marine - **Echinodermata (except Synapta similis which lives in brackish water)**
- Echinoderms are - **Bottom dwellers and benthic**
- A group of triploblastic animals with pentamerous radial symmetry - **Echinodermata**
- Phylum with bilateral symmetry in the larval forms and Pentaradial symmetry in adult forms - **Echinodermata**
- Coelom in Echinodermata is - **Enterocoelic coelom**
- Parasites in Echinodermata are - **Absent**
- Headless, Brainless, True coelomate invertebrates- **Echinodermata**
- Body of Echinoderms is distinguishd into - **Oral and aboral surfaces**
- Feeding in Echinoderms - **Herbivores (or) carnivores**
- Pincer like organs userful for cleaning - **Pedicellariae**
- Endoskeleton consists of **calcareous ossicles** in the **dermis**
- Location of mouth mostly on the - **Oral surface**
- Location of anus - **mostly on the aboral side**
- Most distinguished feature of echinoderms - **water vascular (or) Ambulacral system** derived from **coelom**
- Organs of locomotion and food collection, gas exchange and excretion - **Tube feet**
- Special outgrowths of body wall uiseful in gas exchange are - **papulae, genital bursae, peristomial gills and respiratory trees**
- Blood vascular system - **Open and poorly develooped**
- Excretion takes place through - **Tube feet and papulae. No special organs of excretion are present**
- Nitrogenous waste in echinoderms is - **Ammonia**
- Central nervous system consists of - **circum oral nerve ring and radial nerves**
- **Peripheral nervous system** consists of **two nerve nets**, one in the epidermis and the other in the coelomic epithelium.
- Nervous system lacks **ganglia**
- Sexuality - **Unisexual**
- Fertilization is - **External**
- Cleavage is **radial and indeterminate**
- Development is - **Indirect**
- Larvae - **Planktonic and Bilaterally symmetrical**
- Hypothetical larva of Echinoderms - **Dipleurula**
- Many psecies exhibit **autotomy and** have remarkable power of **regenration**

CLASSIFICATION

- Echinodermata is divided into two subphylas - **Palmatozoa, Eleutherozoa**

SUB PHYLUM - PELMATOZOA

- Oral surface is **upward**

- Mouth and Anus is present on the **oral surface**
- Madreporite is **absent**
- Ambulacral grooves are **open**

CLASS : CRINOIDEA

- Sealillies and feather stars belong to the class - **Crinoidea**
- Sessile crinoides with a stalk and cirri are - **Sealillies**
- Free swimming crinoides without stalk and with cirri - **Featahe r stars**
- Arms in Crinoidea
- **Five dichotomously branched (bifurcated) arms** with pinnately arranged **pinnules**
- Spines, madreporite and Pedicellariae in Crinoidea - **Absent**
- Larva of crinoids - **Diloilaria**
- The second larval stage of feather star - **Pentacrinoid** which is stalked and sessile.
- Viscera is enclosed in a calcareous test called - **Theca**
- The aboral cup of theca is - **Calyx**
- The oral cover of theca is - **Tegmen**
- Condition of arms is - **Biramous**
- Tube feet - **without suckers**

  Eg :

Scientific Name	***Common Name***
Ptilocrinus	**Sea lilly with cirri**
Bathy crinus	**Sealilly without cirri**
Antedon	**Feather star**
Neometra	**Feather stat**

SUBPHYLUM :: ELEUTHEROZOA

- Oral surface is directed towares the **substratum**
- Anus, if present, is on **aboral surface**
- Madreporite is **present**
- Ambulacral grooves are **closed**, except in **Asteroidea**
- The subphylum which iuncludes free moving stalkless Echinoderms - **Eleutherozoa**

CLASS :: ASTEROIDEA

- 'Sea Stars' (or) 'Star Fishes' belong to the class - **Asteroidea**
- Arms in sea stars - **Five blunt arms radiate from a central disc**
- Ambulacral grooves sea star - **Open extend upto the end of arms**
- Location of Madreporite and anus - **Aboral surface**
- Location of mouth - **Oral surface**
- Tube feet in star fishes - **Well developed with suckers**
- Tube feet with out suckers in - **Astropecten**
- Respiratory organs - **Papulae or dermal branchiae**
- Pedicellariae possess - **Two jaws**
- 'Automy' of arms is - **Common**
- Larvae of star fishes - **Bipinnaria, Branchiolaria**

  Eg : Asterias, Pentaceros, Palmipes

CLASS : OPHIUROIDEA

- Basket stars or Brittle stars (or) serpent stars belong to the class - **Ophiuroidea**
- Arms in Brittle stars - **Five long slender arms radiate from a distinct central disc**
- The animals which move by serpentile lashing arms - **Ophiuroidea**

- Arms branches in - **Gorgonocephalus**
- Anus in Brittle stars is - **Absent**
- Ambulacral grooves in brittle stars - **Closed**
- Tube feet - **Sucker less**
- Respiratory organs - **Genital bursae**
- Location of mouth and Madreporite - **Oral surface**
- Pedicellariae in Brittle stars are - **Absent**
- 'Automy' of arms - **common**
- Larva of Brittle star - **Ophioplueteus**

  Eg :

  Ophiothrix - Spiny brittle star

  Gorgonocephalus (Basket star)

CLASS : ECHINOIDEA

- Members of class Echinoidea are commonly know as - **Sea urchins**
- Body shape in sea urchins - **Globular, spherical (or) Heart shaped (or) Disc shaped**
- Skeleton enclosing the body of sea urchin - **Test (or) Corona**
- Spines in sea urchins - **Sharp movable spines in rows**
- Pedicellariae in sea urchins - **Three jawed**
- Location of anus and madreporite - **Aboral surface**
- Respiratory organs - **Peristomial gills**
- Ambulacral grooves in Sea urchins - **Ambulacral grooves closed**
- The masticatory structure present in Echinoidea - **Aristotle's lantern**
- Arms in sea urchins - **Absent**
- Tube feet in sea urchins - **Absent**
- Characteristic larva of sea urchins - **Echinopluteus**

  Eg : from Echinoidea

Common Name	**Generic Name**
Heart urchin	***Echino cardium***
Cake urchin, Sea bicuit	***Clypeaster***
Sand dollar (or) Sea disc	***Echinoidiscus***

CLASS : HOLOTHUROIDEA

- Sea cucumbers belong to the class - **Holothuroidea**
- Burrowing echinoderms - **Sea cucumbers**
- Arms spines and pedicellariae in sea cucumbers - **Absent**
- Body shape - **Cylindrical with mouth and cloaca at opposite ends**
- Cloaca of sea cucumber is surrounded by - **Respiratory trees**
- Ambulacral grooves in sea cucumbers - **closed**
- Leathery skin in sea cucumbers contains - **Calcareous spicules**
- Madreporite in sea cucumbers - **Internal**
- Tentacles surrdounding the mouth are modified from - **Tube feet**
- Characteristic larva of sea cucumber - **Auricularia**

  Eg : Cucumaria

  Synapta (largest and estuarine)

  Thyone

  Echinoidea and Holothuroidea are placed under the taxon - **Echinozoa**