CLASSIFICATION OF PORIFERA

The porifera (Latin porus, pore + ferre, to bear) are lowly multicelular animals incapable of movements being attached to the substratum like a plant.

DEFINITION:—

The porifera are metazoa that show radial symmetry or are asymmetrical. Definite organs such as mouth or nervous centres etc. are lacking, whereas the body is covered with pores, canals and chambers through which water current flows, and there are one to many internal cavities lined by collared cells or choanocytes.

GENERAL CHARACTERS:—

(1) Multicellular organisms invariably sessile and aquatic.
(2) Asymmetrical or radially symmetrical body.
(3) Body is perforated by ostia, canals and chambers through which water flows.
(4) They are the only metazoans that posses choanocytes.
(5) Their skeleton is made up of spicules or spongin or both.
(6) They lack the power of locomotion. Completely sessile, larval forms are free swimming.
(7) The digestive cavity is wanting, the digestion is intracellular.
(8) Only metazoans without nervous tissues.
(9) They have high power of regeneration.
(10) Both hermaphrodite and unisexual.
(11) The development is indirect.
(12) They are widely distributed and abundant from low tide marks to depths of 3-5 miles.
(13) They are all marine with exceptional family Spongillidae.

CLASSIFICATION :—

The adopted classification is designed by storer and Usinger (1971). The basis of classification is presence or absence of the forms of skeleton.

Class (1) — Calcarea

(i) Skeleton is formed of calcareous specules monaxon or 3 or 4 branched.
(ii) The collar cells are comparatively larger.
(iii) They are marine and inhabit shallow waters.

Order (1) — Homocoela

(i) Body is asconoid. Thin body wall having no folded internally.
(ii) Choanocyte layer is continuous.
(iii) Canal system is of ascon-type.
Examples :— Leucosolenia, Clathrina

Order (2) Heterocoela

(i) Body is of syconoid or leuconoid type with body wall thicked and folded internally.
(ii) Choanocytes layer is continuous.
(iii) Canal system is of ~~ascon type~~ syconoid or leuconoid type.
Examples :— ~~Leucosolenia, Clathrina~~ Scypha or sycon.

Class (2) — Hexactinellida

(i) Body cylindrical, vase or funnel shaped, radially symmetrical, measuring up to 3 feet in length, fastened at the base by a root tuft of spicules.
(ii) Skeleton composed of triaxon, six-rayed Siliceous spicules.
(iii) Canal system is simple having branched or unbranched radial canals.
(iv) Solitary exclusively marine forms. They are mostly deep sea inhabitants and widely distributed.

Order (A)- Hexactinellida

(i) Spicules are hexasters i.e, star-like in shape.
(ii) Radial canals or flagellated chambers are simple.
(iii) They are not attached by root-tufts but commonly attached to any object.

Examples:- (1) Euplectella (2) Staurocalyptus

Order (B)- Amphidiscophora

(i) Spicules are amphidiscs. No hexasters.
(ii) They are attached to the substratum by root-tufts.

Examples:- Hyalonema, Pheronema

Class (3)- Demospongiae (few fresh water)

(i) Body asymmetrical often massive and brightly coloured.
(ii) Skeleton consists of siliceous or spongin fibres or a combination of siliceous spicules and spongin fibres or absent. The spicules are either straight and needle-like (monaxon) or having eight-rays (tetraxon) but never six-rayed.
(iii) Canal system is complicated (Leucanoid type) having small spherical radial canals or flagellated chambers. Spongocoel is entirely absent.
(iv) Demospongiae are wide spread in nature and includes majority of present-day existing species.

Sub-class (A) Tetractinellida

(i) Sponges are mostly solid and simple rounded cushion like flattened in shape usually without branches.
(ii) Skeleton comprised mainly of tetraxon Siliceous spicules but absent in order myxospongida.
(iii) Canal system is leuconoid type.
(iv) Shallow water forms.

Order (a) Myxospongida

(i) Simple structure
(ii) Skeleton absent

Examples:- Oscarella, Halisarca

Order(b):- Carnosa
(i) Simple structure
(ii) Spicules are not differentiated into megascleres and microscleres. Asters may be present.
Ex:- Plakina, Chondrilla

Order(c):- Choristida
(i) Spicules are differentiated into megascleres and microscleres.
Ex:- Geodia

Sub-class(B):- Monaxonida
(i) Monaxonids occur in a variety of shapes from bounded mass to branching type of elongated or stalked with funnel or fan shaped.
(ii) Skeleton consists of monaxon spicules with or without spongin.
(iii) They are found in abundance throughout the world.
(iv) Shallow and deep water forms.

Order(a):- Hadromerina
(i) Monaxon megascleres in the form of tylostyles.
(ii) Microscleres when present in the form of asters.
(iii) Spongin fibres are absent.
Ex:- Cliona, Tethya, Poterion, Ephydatia

Order(b):- Halichondrina
(i) Monaxon megascleres are often of two types, i.e - Monactines and diactines.
(ii) Microscleres are absent.
Examples:- Halichondria

Order(c):- Poecilosclerina
(i) Monaxon megascleres are of two types, one types in the ectoderm and another type in the choanocyte layer.
(ii) Microscleres are typically chelas, sigmas and toxas.
Ex:- Cladorhiza, Microciona

Order (d):- Haplosclerina

(i) Monaxon megascleres are of only one type i.e - diactinal.
(ii) Microscleres absent.
(iii) Spongin fibres are generally present
Ex:- Chalina, Pachychalina, Spongilla (fresh water)

Sub-class (C) Keratasa :-

(i) Body is rounded and massive with a number of conspicuous oscula.
(ii) Skeleton composed of network of spongin fibres siliceous spicules are present.
(iii) They are also known as horny sponges, found in shallow and warm waters of tropical and subtropical regions.
Examples :- Euspongia, Hippospongia, Hircinia.