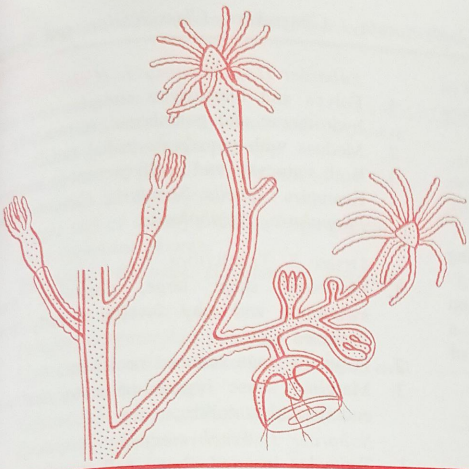

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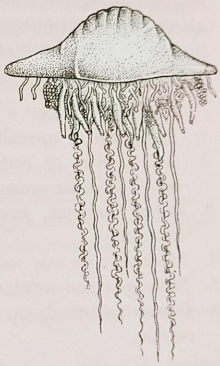
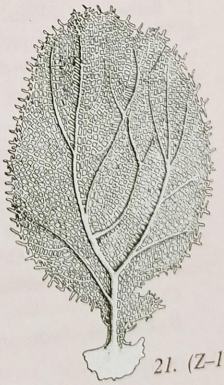
Coelenterata : Characters, Classification and Types

GENERAL CHARACTERS



1. All aquatic, some freshwater, mostly **marine**.
2. Solitary or colonial. Sedentary or free-swimming.
3. Symmetry **radial** or **biradial** about a longitudinal oral-aboral axis.
4. Body organization of **cell-tissue grade**. Cells mostly scattered and specialized for different functions. Some cells form tissues like **nerve net** or **nervous tissue**.
5. Exoskeleton chitinous (perisarc) or calcareous (corals).
6. Body wall **diploblastic** with two cellular layers —outer epidermis and inner gastrodermis — with a gelatinous acellular mesogloea in between. In advanced types mesogloea with cells and connective tissue, hence **triploblastic**.
7. Two types of individuals occur, attached **polyps** and free-swimming **medusae**. Some species are notable for **polymorphism** or variety of forms.
8. Mouth of polyps and bell margin of medusae often encircled by short and slender **tentacles**.
9. Coelom and respiratory, circulatory and excretory systems wanting.
10. Muscular system includes longitudinal and circular fibres formed by epithelio-muscle and endothelio-muscle cells.
11. A single internal cavity, lined with gastrodermis, called **gastrovascular cavity** or **coelenteron**, into which mouth opens. Anus is absent.
12. Digestion intracellular as well as extracellular.
13. One or both body layers with peculiar stinging cell organelles or **nematocysts**, which serve for adhesion, food capture, offence and defense.



21. (Z–1)

14. Nervous system primitive, consisting of a diffuse **nerve net**. Central nervous system absent.
15. Sensory organs form **ocelli** and **statocysts**.
16. **Asexual reproduction** by budding or fission. **Sexual reproduction** by ova and sperms. Sexual forms monoecious or dioecious.
17. Development includes a free-swimming ciliated **planula larva**.
18. Life-history illustrates a regular alternation between the asexual polypoid stage and a sexual medusoid stage. True alternation of generations absent.

(4) Sponge is characterised by having peculiar filaments of unknown nature throughout the body.
(5) Skeleton consists of spongin fibres forming net-work like structures.
(6) Skeleton consists of spongin fibres.

Identification : Since the specimen has **conules**, **oscula** and all above features, hence it is ***Hircinia***.

Instructions : *Study and draw. Dehydrate a small portion of the dried sponge with alcohol, clear in xylol and mount in balsam. Note the horny spongin in fibres which form a network. Compare the structure of the three principal types of sponges.*

PHYLUM COELENTERATA

Natural history

Coelenterates are full of natural beauties. They are all aquatic but chiefly marine, attached or pelagic. Originating from lower Cambrian, they are still flourishing and comprise about 10,000 species. Coelenterates are the first animals to have tissues. They may be solitary as *Hydra* or colonial like corals. Further, they may be either polypoid, medusoid existing in polyp form or medusa form or both. The phylum includes the hydroids and hydromedusae, jelly fishes, sea anemones and corals. Several hydroids may grow plant like colonies while jelly fishes and many hydroids swim freely. The flower like sea anemones stick on rocky ocean coasts and the corals with their tiny skeletons constitute reefs. Many Coelenterates are bioluminiscent. The corals are used for jewellery and other decorative purposes.

Diagnostic characters

(1) Tissues grade animals.
(2) Diploblastic made of ectoderm, endoderm and intervening mesoglea.
(3) Only a single cavity, gastrovascular cavity or coelenteron present.
(4) Division of labour occurs.
(5) Solitary or colonial, fresh-water or marine.
(6) Colony dimorphic consisting of feeding zooids or polyps and reproductive zooids or medusae, with several variations. Nematocysts present.
(7) Reproduction sexual or asexual.

Classification

CLASS I HYDROZOA

1. Either polypoid or medusoid or both.
2. Solitary or colonial.

Order 1 Hydroidea

1. Polypoid stage predominant.
2. Medusa present or absent.

Sub-order I Athecata or Anthomedusae

1. Polyp athecate (perisarc does not form hydrotheca)
2. Freshwater or marine

Ex. *Hydra, Ceratella, Hydractinia, Eudendrium, Pennaria, Bougainvillea, Tubularea.*

Sub-order II Thecata or Leptomedusae

1. Both polyp and medusae thecate (with hydrotheca and gonotheca).
2. Statocyst mostly present.

Ex. *Obelia, Plumularia. Companularia, Antennularia.*

Order 2 Hydrocorallina

1. Exoskeleton calcareous.
2. Polyps are gastrozooids and dactylozooids.

Sub-order I Milleporina

1. Polyps scattered.
2. Separate pores for gastrozooids and dactylozooids. Ex. *Millepora.*

Sub-order II Stylasterina

1. Calcareous exoskeleton, branching or encrusting.
2. Dactylozooids surround gastrozooids.

Ex. *Stylaster.*

Order 3 Trachylina

1. Medusoid stage dominant polyps absent or poorly developed.
2. Sense organs statocysts or tentaculocysts.

Sub-order I Trachymedusae

1. Marginal tentacles oral.
2. Gonads on radial canals.

Ex. *Gonionemus.*

Sub-order II Narcomedusae

1. Gonads on stomach floor.
2. Tentaculocysts naked.

Ex. *Cunia, Aggina.*

Order 4 Siphonophora

1. The animals show polymorphism.
2. Different polypoid and medusoidzooids.

Sub-order I Calycophora

1. Pneumatophore absent.
2. Polypoid and medusoid.

Ex. *Praya, Abyla, Diphyes.*

Sub-order II Physophorida

1. Pneumatophore present.
2. Polypoid and medusoid.

Ex. Physalia, Porpita, Velella.

CLASS II SCYPHOZOA

1. Exclusively medusoid.
2. Medusae umbrella-shaped without velum.

Order 1 Stauromedusae

1. Bell trumpet shaped.
2. Sessile, attached by stalk.
   Ex. *Lucernaria, Haliclystus.*

Order 2 Cubomedusae

1. Bell cubical.
2. Found in tropical and subtropical oceans.
   Ex. *Charybdea Chiropsalmus.*

Order 3 Coronatae

1. Bell conical with transverse construction.
2. Deep see forms. Ex. *Pericolpa.*

Order 4 Semaeostomae

1. Bell disc-shaped.
2. Cosmopolitan.
   Ex. *Aurelia, Cyanea, Pelagia, Chrysaora.*

Order 5 Rhizostomae

1. Bell margin with no tentacle.
2. Tropical and subtropical
   Ex. *Rhizostoma, Cassiopea, Mastigias.*

CLASS III ACTINOZOA (= ANTHOZOA)

1. Exclusively polypoid. No medusae.
2. Gastrovascular cavity divided by 8 or more mesenteries.

Sub-class A. Octocorallia

1. Tentacles and mesenteries 8 or multiple of 8.

Order 1 Stolonifera

1. Organ pipe coral.
2. Polyps not fused and arise from a creeping mat or stolon.
3. Skeleton of calcareous tubes or spicules or absent.
   Ex. *Tubipora.*

Order 2 Telestacea

1 Lateral polyps on single or branched stem.
2. Skeleton of calcareous spicules.
   Ex. *Telesto.*

Order 3 Alcyonacea

1. Polyps and spicules embedded in fleshy coenenchyme
2. Soft corals. Ex. *Alcyonium.*

Order 4 Coenothecalia

1. Brown polyps. Skeleton massive and calcareous.
2. Blue corals. Ex. *Heliopora.*

Order 5 Gorgonacea

1. Tree or feather like colony containing short polyps and central skeleton of Gorgonin.
   Ex. *Gorgonia, Corallium.*

Order 6 Pennatulacea

1. Colony consists of stalk and rachis with lateral branches. bearing dimorphic polyps.
2. Sea pens. Ex. *Pennatula, Pteroides, Renilla.*

Sub-class B. Hexacorallia

Tentacles and mesenteries 6 or multiple of 6.

Order 1 Actiniaria

1. Body muscular without skeleton.
2. Tentacles and mesenteries.
   Ex. *Metridium, Adamsia, Minyas, Tealia, Edwardsia, Actinia.*

Order 2 Zoanthidia

1. Mostly epizoic, solitary or colonial.
2. One complete and one incomplete mesentery in each pair. Ex. *Zoanthus, Epizoanthus.*

Order 3 Ceriantharia

1. Without pedal disc.
2. Numerous mesenteries. Ex. *Cerianthus.*

Order 4 Madreporaria

1. Solitary or Colonials hard corals.
2. Hard calcareous skeleton.
   Ex. *Madrepora, Astrea, Favia Fungia, Menadrina, Astrangia, Dendrophylla.*

Study of Museum Specimens