

Cnidaria

- Tissue-grade organisms
- Current definition: diploblastic metazoa with radial, biradial or radial bilateral symmetry lacking a through gut or anus; tentaculate, equipped with specialized stinging cells (cnidoblasts or nematocysts). Generally polymorphic.

Derivation of diagnosis:

Aristotle (384-322 BC):	<ul style="list-style-type: none"> • <i>Acalephe</i> = nettle • <i>Cnidos</i> = thread 	<ul style="list-style-type: none"> • <i>Zoophyta</i> = both plant and animal characteristics 	
Cuvier (1817)	<i>Radiata</i>	<ul style="list-style-type: none"> • <i>Polyps</i> (included hydroids, bryozoa, anthozoa, and sponges) • <i>Acalephae</i> (included medusae, siphonophores, and anemones) 	
Lamarck (1822)	<i>Radiata</i>	<ul style="list-style-type: none"> • Medusoid coelenterates • <i>Echinodermata</i> 	
Escholtz (1829)	<i>Radiata</i>	<ul style="list-style-type: none"> • <i>Zoophyta</i> • <i>Echinodermata</i> • <i>Acalephe</i>* 	*Escholtz's <i>Acalephe</i> include: medusae, ctenophora, and siphonophora
Sars (1829)	Observed that <i>Aurelia</i> has both polypoid and medusae stages in ontogeny, therefore verifying that both morphologies are present in concept of <i>Radiata</i> .		
Ehrenberg (1833)	<i>Anthozoa</i>		
Leuckart (1847)	Divided Cuvier's <i>Radiata</i> into two groups	<ul style="list-style-type: none"> • <i>Echinodermata</i> • <i>Coelenterata</i>* (<i>koiilos</i> = cavity, <i>enteron</i> = intestine) 	*Leuckart's coelenterates include sponges, ctenophora, and current concept of "cnidaria"
Huxley (1856)	<i>Hydrozoa</i>		
Hatschick (1888)	<i>Coelenterata</i>	<ul style="list-style-type: none"> • <i>Spongaria</i> • <i>Cnidaria</i> • <i>Ctenophora</i> 	
Haeckel (1891)	<i>Scyphozoa</i>		

Morphological terminology:

- Polyps:
oral disk--anterior, tentaculate
mouth--duh

stomadeum--oral projection of mouth
 pharynx--throat
 siphonoglyphs--tube-like ends of pharynx, creates biradial symmetry
 tentacle--elongated ectoderm of oral disk with nematocysts
 enteron--duh
 gastrodermis--endodermal tissue
 directive mesenteries (coupled, pairs)--veil like partitions of enteron, gonad attachments
 longitudinal muscles--mesenteries
 aboral disk--posterior, site of attachment and calice secretion
 corallite--soft tissue
 calice--individual aboral secretion by polyp
 corallum--skeleton
 theca--synonym for calice
 septum--longitudinal wall of calice

hydranth--specialized polyp of hydrozoan with cup (hydrotheca) surrounding oral surface
 gastrozoid--specialized polyp of colonial hydrozoan, essentially a manubrium-like mouth
 dactylozoid--specialized polyp of colonial hydrozoan, elongate tentacles with nematocysts
 ampullae--specialized of colonial hydrozoan polyp for producing medusae
 coenosarc--connecting framework of tubes in a colonial hydrozoan
 perisarc--polysaccharoidal secretion of ectoderm typical in hydrozoa

- **Medusae**
 - bell--has thick mesoglea
 - manubrium--equivalent to stomadeum
 - statocyst--phosphatic pellet secreted in pockets of bell for stability
 - sail--
- **Other**
 - cnidoblast--
 - nematocyst--
 - cnidocil--trigger for cnidoblast
 - barbs and stylets--on flagellum of cnidoblast
 - planula--ciliated larva formed from zygote of all cnidaria
 - scyphistoma--polyp stage for producing medusae through strobilation (budding)
 - ephyra--small medusae produced from scyphistoma

Three Major Classes

Hydrozoa

- Radial or tetrameral symmetry
- polypoidal stage dominant
- typically colonial and polymorphic (bushy)
- hydrocorallines (fire coral) Tertiary to Recent (*Milliporina* and *Stylasterina*)
- trachylines (entirely medusoid) ?Jurassic to Recent
- siphonophores (complex medusoid colonies lacking hard parts), Ordovician to Recent
- actinulids

Scyphozoa

- predominantly marine and medusoid
- radial tetrameral symmetry
- thick mesoglea
- fission and strobilation
- no velum
- Ediacaran to Recent

Anthozoa

- marine
- no medusoid stage, always possess a gullet or stomodeum

Order Ceriantipatharia--no fossil record

Order/Subclass Octocoralla--

- horny branching skeletons, commonly spiculate or with calcified core, anastomosing branches, includes gorgonians, eight tentacles on polyps.
- *Pennatulacea* are also present in Ediacaran faunas, first spicules are Ordovician, good gorgoneans first appear in Cretaceous.

Order Zooantheria --

- includes unmineralized anemones

Order Tabulata

- Calcite corallum, invariably colonial, individual corallites small, prominent tabulae, septae reduced or commonly absent
- Early Middle Ordovician through Permian

Order Rugosa or Tetracorallia

- Calcite corallum, solitary or colonial, septal insertion in quadrants. commonly forming a biradial symmetry, epitheca normally present and commonly rugose
- Middle Ordovician (Blackriveran through Permian)
- proseptum divided into cardinal (C) and counter (K) septae
- alar (A) septae are next inserted adjacent to cardinal septum
- counter-lateral (KL) septae are then inserted next to the counter septum
- fossulae occur because of lack of metaseptae inserted in later growth stages adjacent to cardinal or alar septae.

Order Scleractinia or Hexacorallia

- Aragonite corallum, solitary or colonial, septal insertion between directing mesenteries in multiples of six,
- Mid Triassic to Recent
- Probably evolved from unmineralized Zoantherian after Permo-Triassic extinction event
- hermatypic forms with *Zooxanthellae*
- reef ecology hinges around *Zooxanthellae* (photic zone, temp constraints, latitudinal restrictions, etc)