

Phylum Cnidaria (formerly Coelenterata)

Members of this phylum include the corals, sea anemones, and jellyfish and exist as polyps or medusae, or they alternate stages. The polyp stands on a base with mouth and tentacles extended upward. The medusa floats with mouth and tentacles extending downward. The phylum ranges in geologic time from late Precambrian to Recent (Fig 4.17).

Classes: Hydrozoa, Scyphozoa (hydra and jellyfish)

These classes are rare in fossil form and are not discussed here.

Class Anthozoa

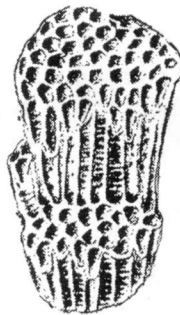
This class includes the corals. Corals have a polyp stage only, with no medusa stage in the life cycle. Though some corals are soft and have no calcareous skeletons, hard corals secrete aragonite skeletons. The skeleton is tube-shaped, and has walls that extend upward as the polyp grows; the tube is called a corallite. As the polyp grows, it lifts its base and secretes a support plate beneath it. A flat plate is called a tabula, and small plates along the edge of the corallite are called dissepiments. In addition to the tabula and dissepiments, corals secrete radial plates that stand vertically between the folds of tissue at the base of the polyp. These vertical walls, or septae, look a little like the section dividers in a grapefruit. Hard corals are either solitary or colonial. Solitary corals have corallites that are not attached to any other corallite. In colonial corals, the corallites are attached to one another, forming colonies of various sizes and shapes.



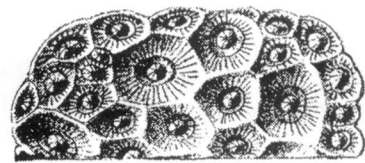
(a) Lophophyllum (Penn-Perm)



(b) Heliophyllum (Dev)



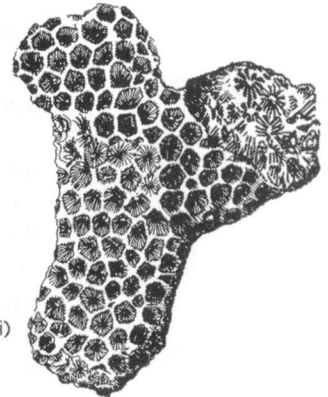
(c) Favosites (Ord-Perm)



(d) Lithostrotionella (Miss)

0.5 cm

Septastrea (Mio-Plio)



(i)



(j) Streptelasma (Ord-Dev)

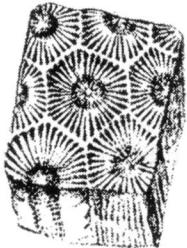
0.5 cm



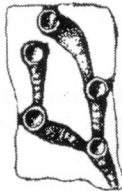
(e) Halysites (Ord-Sil)



(f) Microcyclus (Dev-Miss)



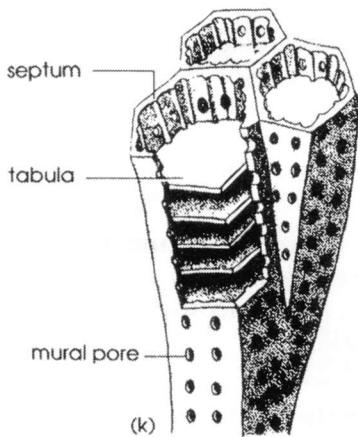
(g) Hexagonaria (Dev)



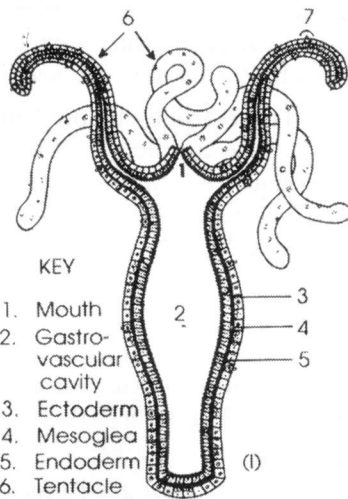
(h) Aulopora (Sil-Penn)

CENOZOIC		CORALS
MESOZOIC	CRETACEOUS	
	JURASSIC	
	TRIASSIC	
PALEOZOIC	PERMIAN	
	PENNSYLVANIAN	
	MISSISSIPPIAN	
	DEVONIAN	
	SILURIAN	
ORDOVICIAN		
CAMBRIAN		

(Polished Section)



Tabulate coral morphology (enlarged)

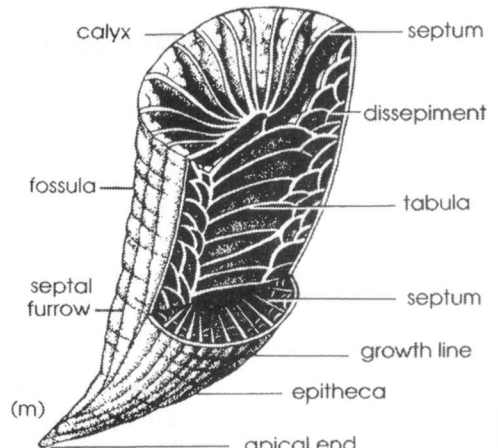


KEY

1. Mouth
2. Gastrovascular cavity
3. Ectoderm
4. Mesoglea
5. Endoderm
6. Tentacle
7. Stinging Cell

Morphology of Soft Parts

Corallite



Rugose coral morphology

PHYLUM CNIDARIA

Figure 4.17 Phylum Cnidaria

Three important groups of hard corals in the fossil record are the Tabulates, Rugosans, and Scleractinians.

Tabulate corals are all colonial. They possess well-developed tabulae but poorly developed septae. They range from middle Ordovician to Permian and became extinct at the end of the Paleozoic era. Examples are *Favosites* [see Fig. 4.17 (c)] and *Halysites* [see Fig. 4.17 (e)].

Rugose corals can be either solitary or colonial. They have well-developed septae in sets of four (tetracorals). On the outside of the corallite are coarse ridges called rugae. The solitary rugosans have a cup or cone shape and are often called horn corals. They range from the middle Ordovician to Permian and were most abundant in the Devonian period. Examples are *Lophophyllidium* [see Fig. 4.17 (a)] and *Heliophyllum* [see Fig. 4.17 (b)]. Recent studies of rugose coral daily and annual growth lines indicate that in the geologic past the number of days in a year differed from the present. This data records the slowing of the earth's rotation.

Scleractinian corals first appear in the middle Triassic and continue to recent times as reef-building or hermatypic corals in modern seas. They are mostly colonial and possess septa in sets of six. Hermatypic scleractinians have a symbiotic relationship with dinoflagellate algae (zooxanthellae), which live within the coral animal's soft tissue. Their skeleton is composed of aragonite, and growth of the skeleton seems to be aided by the zooxanthellae. *Septastrea* [see Fig. 4.17 (i)] is an example from the Pliocene Yorktown Formation of North Carolina.