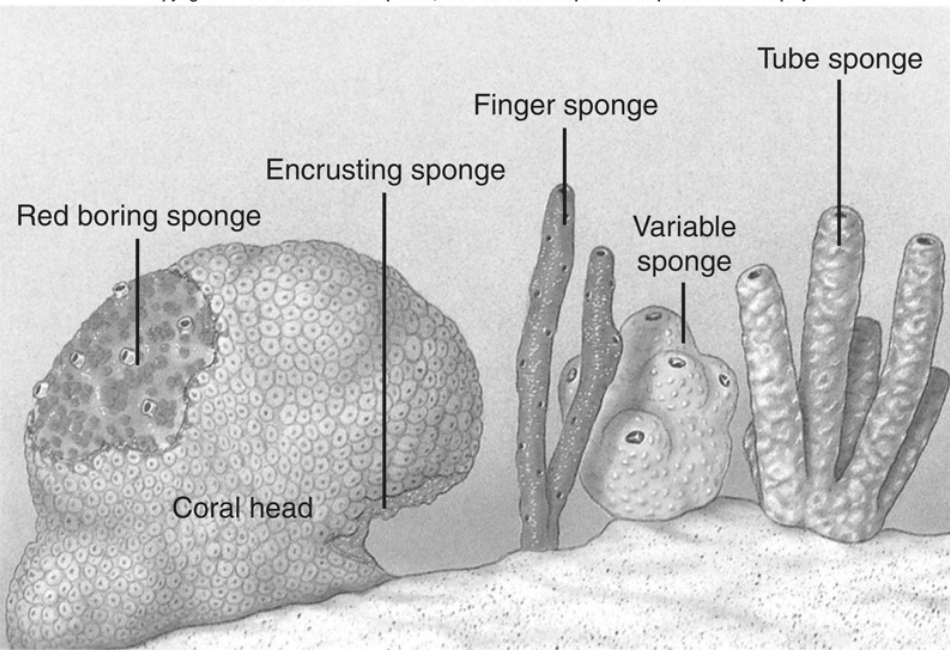


Chapter 12

Porifera

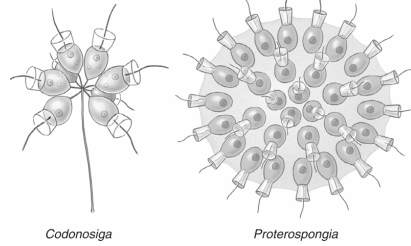
Figure 12.04

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Unicellular Protists

choanoflagellates-colonial organization

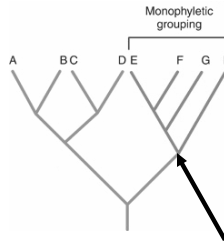


Theories of Unicellular Origin of Metazoans

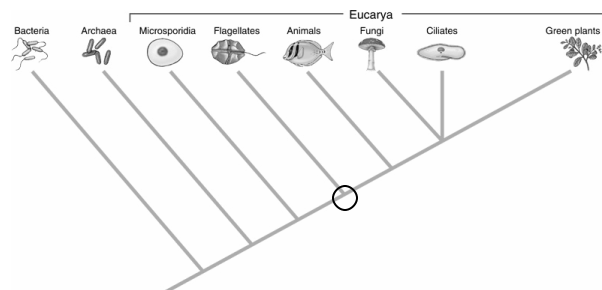
- 1) 1874-Haeckel first proposed metazoans arose from a colonial flagellated form & cells gradually became specialized
- 2) as cells in a colony became more specialized, the colony became dependent on them
- 3) colonial ancestral form was at first radially symmetrical, & reminiscent of a blastula stage of development
- 4) this hypothetical ancestor was called a *blastea*
- 5) another hypothetical ancestral forms similar to a gastrula may have existed, & refer to them as *gastreaa*
- 6) Bilateral symmetry evolved when the planula larvae adapted to crawling on the floor

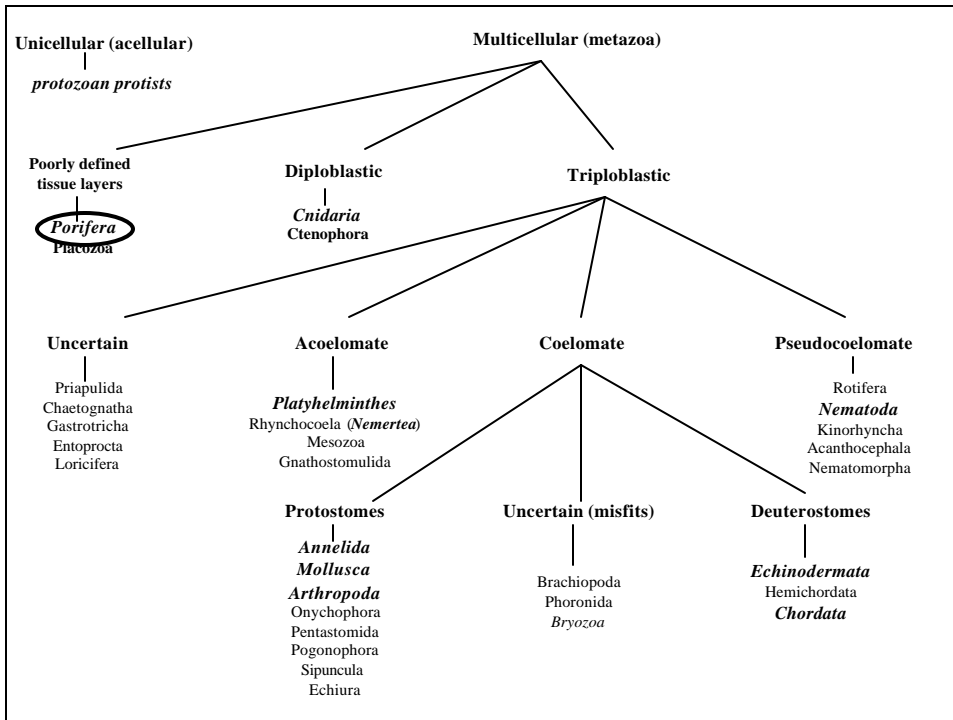
7) Molecular Evidence

- a) small subunit rRNA & biochemical pathways support the *colonial flagellate hypothesis*
- b) metazoans appear to be *monophyletic* & arising from *choanoflagellates*



Monophyletic group contains the most recent common ancestor of all members of the group & all of its descendants





Phylum: Porifera : “pore-bearing”; their sac-like bodies are perforated by many pores.

5000 species

mostly marine: found in all seas and at all depths; they vary greatly in size

few brackish

some 150 live in fresh water

General Features

- 1) some sponges appear *radially symmetrical*, but many are irregular
- 2) some stand erect, some branched, & some encrusting
- 3) embryos free-swimming, adult sponges always attached
- 4) *sessile*: efficient aquatic filter
- 5) flagellated “collar cells”, or *choanocytes*, move water (with food) through pores
- 6) brightly colored → pigments in their dermal cells
- 7) growth patterns often depend on characteristics of the environment
- 8) many other animals live as commensals or parasites in or on sponges
- 9) sponges also grow on a variety of other living organisms
- 10) few animals prey on sponges
- 11) sponges may have elaborate skeletal structure & often have a noxious odor

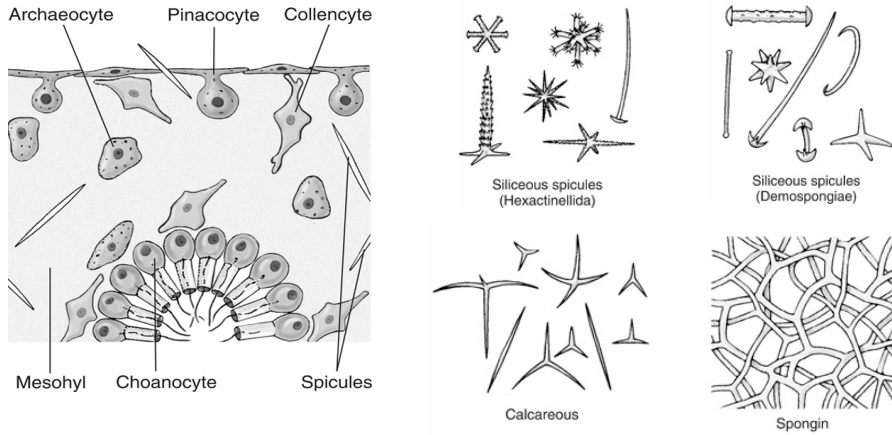
12) skeletal structure of a sponge can be fibrous and/or rigid

a. rigid skeleton: calcareous or siliceous *spicules*

b. fibrous portion → collagen fibrils in intercellular matrix

c. one form of collagen, *spongin*, comes in several types

d. composition along with their shape of spicules → basis of sponge classification



Class

Calcarea small calcareous sponges

spicules

composed of CaCO_3

monaxons or 3 or 4 rays

Hexactinellida glass sponges

spicules

composed of silica

6 rayed

Demospongiae

95% of living sponges

spicules

composed of silica

not 6 rayed

bound together by spongin or may be absent

Figure 12.05

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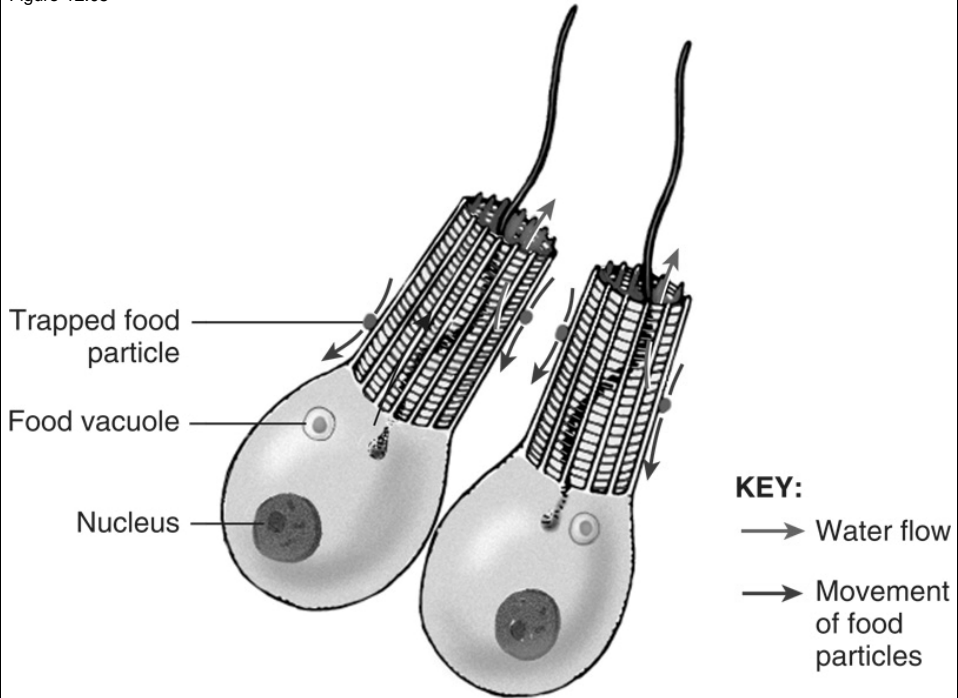


Figure 12.07

Three Body Forms

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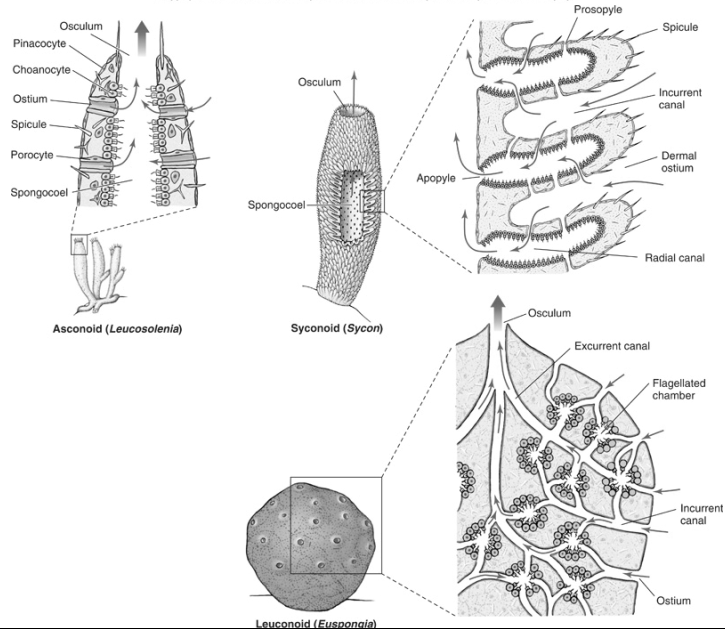


Figure 12.09

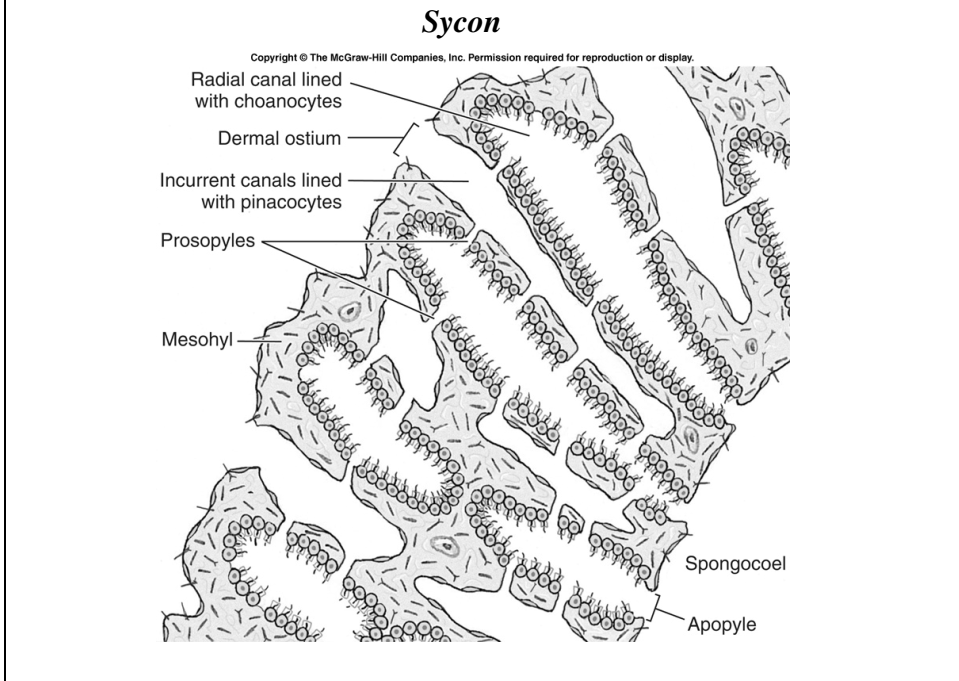


Figure 12.12

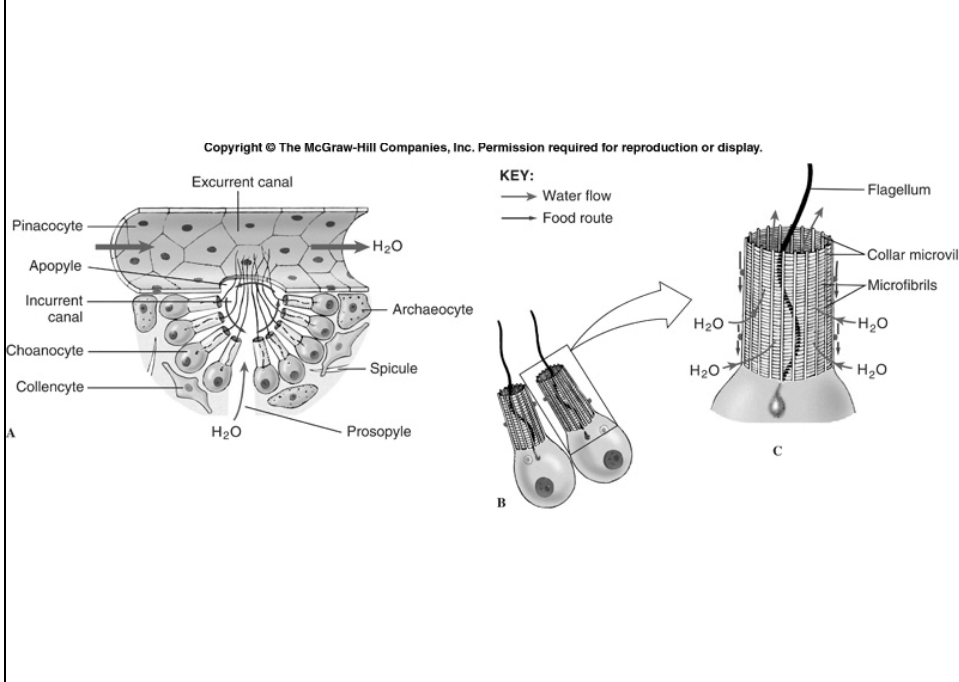


Figure 12.12a

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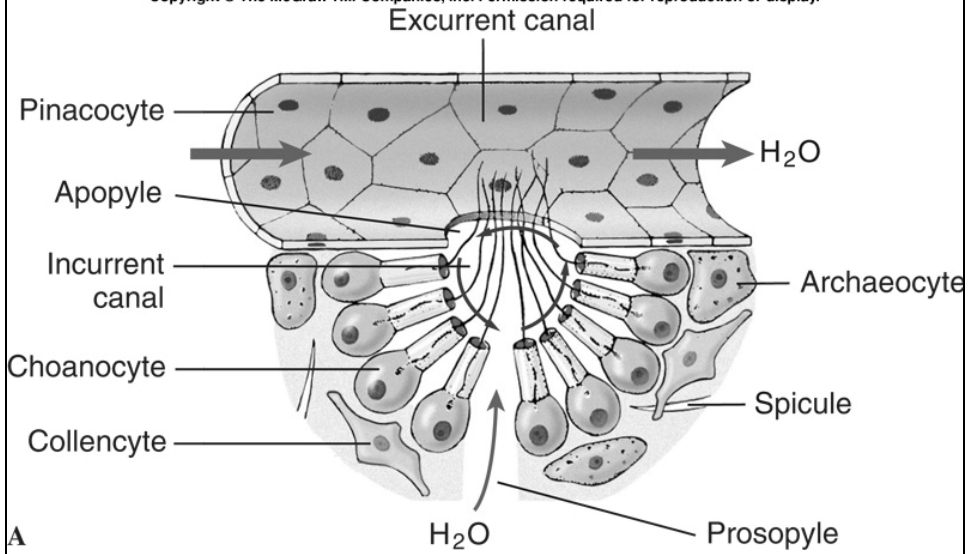


Figure 12.12b

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KEY:

- Water flow
- Food route

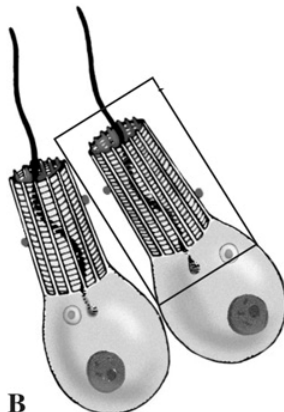


Figure 12.12c

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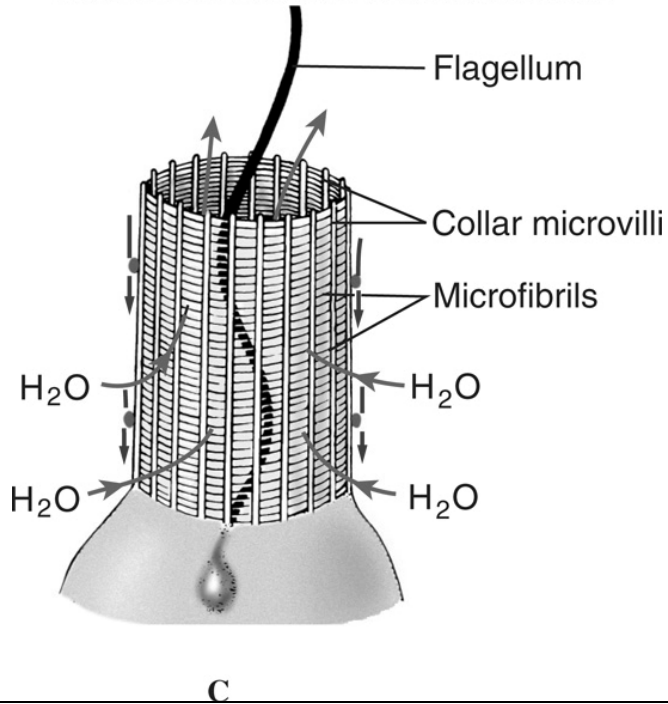


Figure 12.13

Gemmule: reproductive packet filled with archaeocytes

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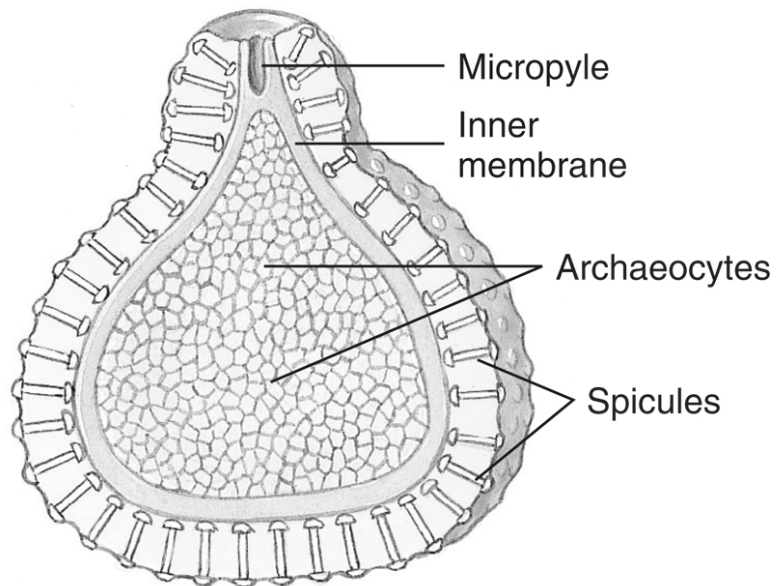


Figure 12.14

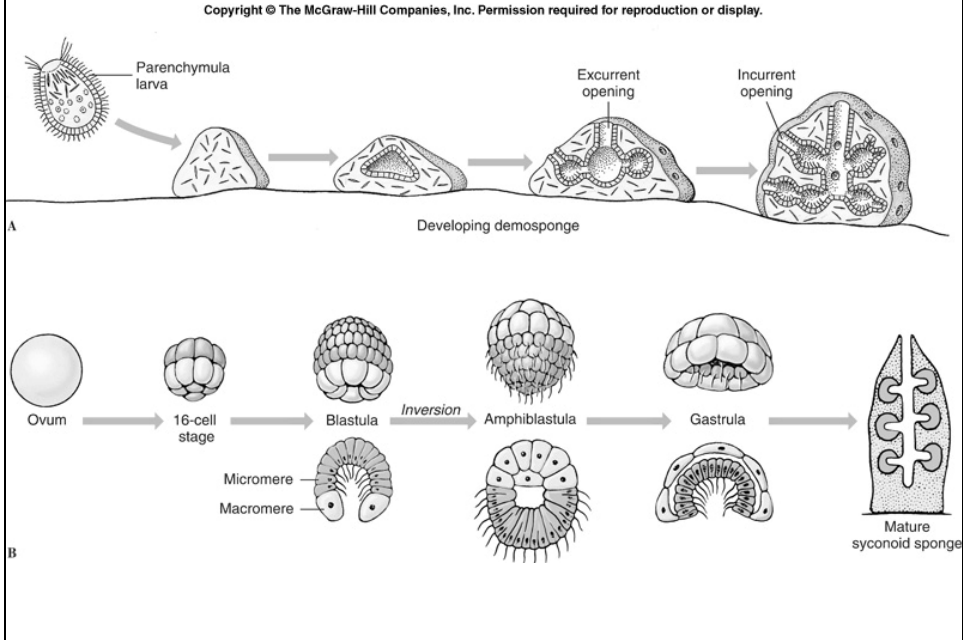


Figure 12.14a

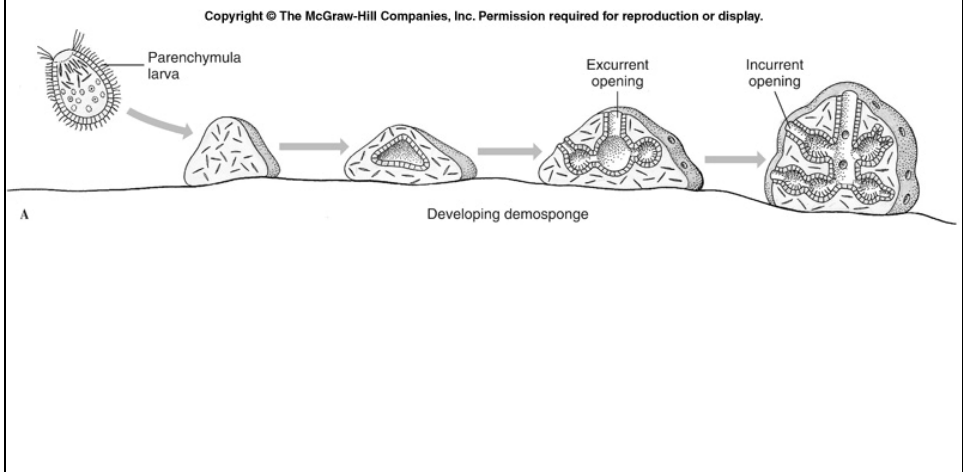


Figure 12.14b

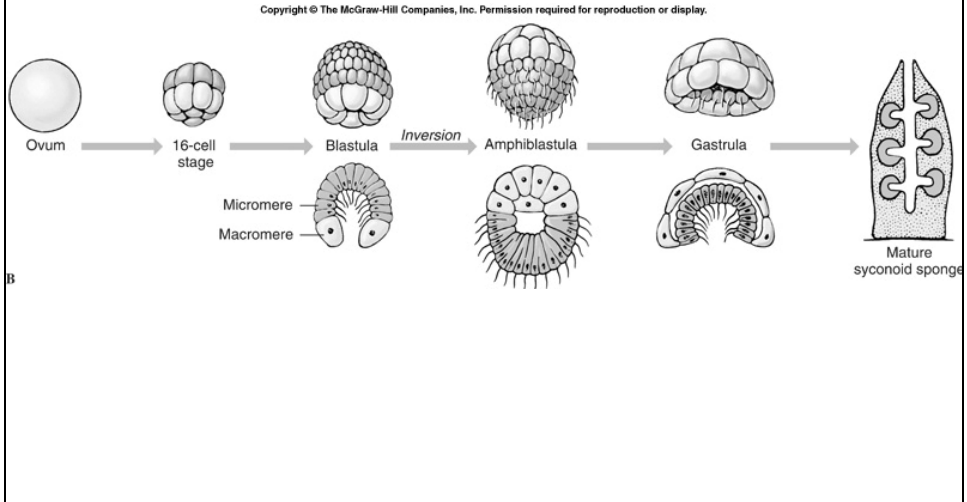


Figure 12.15

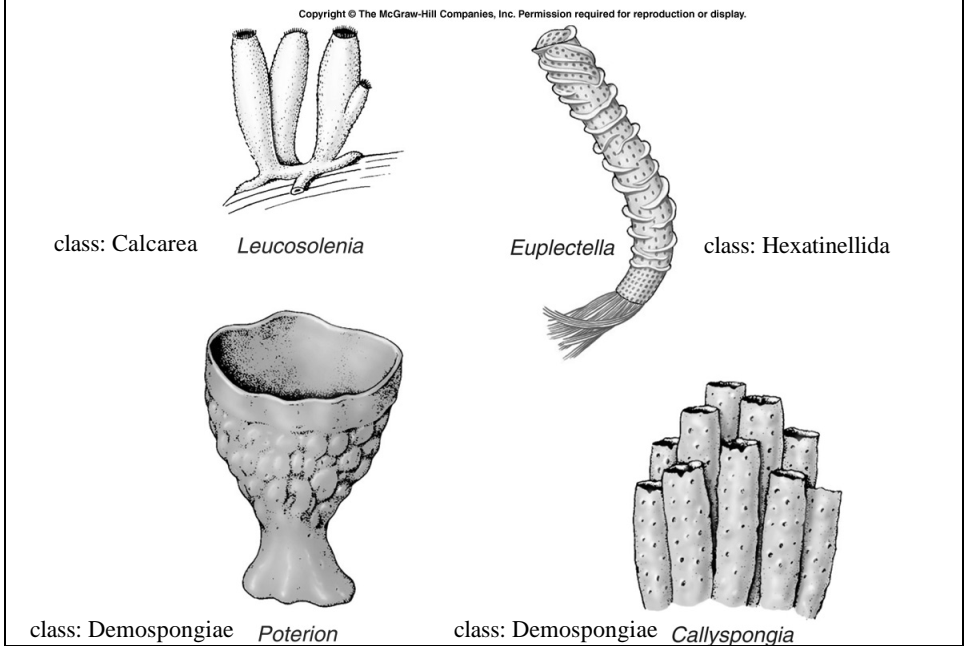


Figure 12.co

class: Demospongiae

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Figure 12.08

Class: Calcarea

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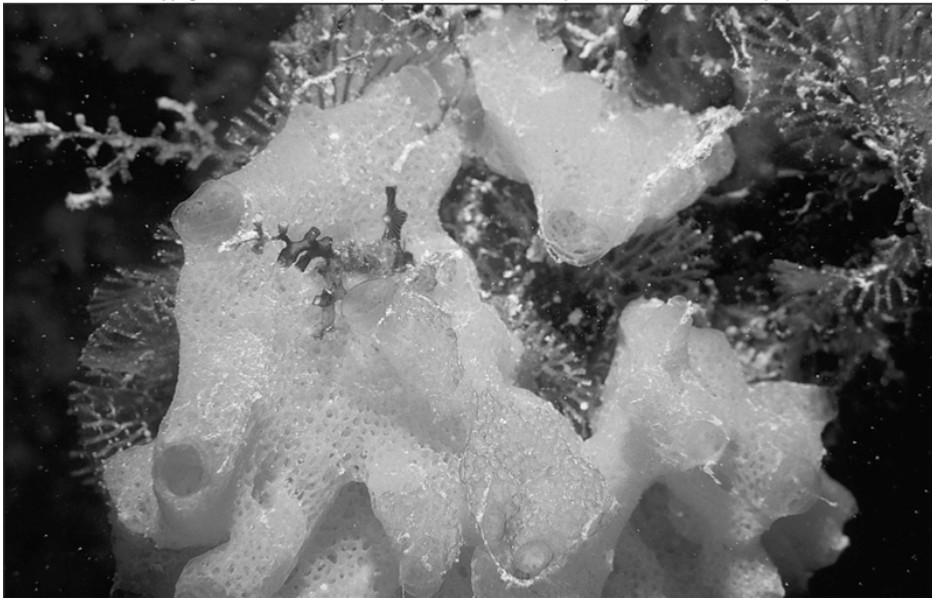


Figure 12.10

Class: Demospongiae

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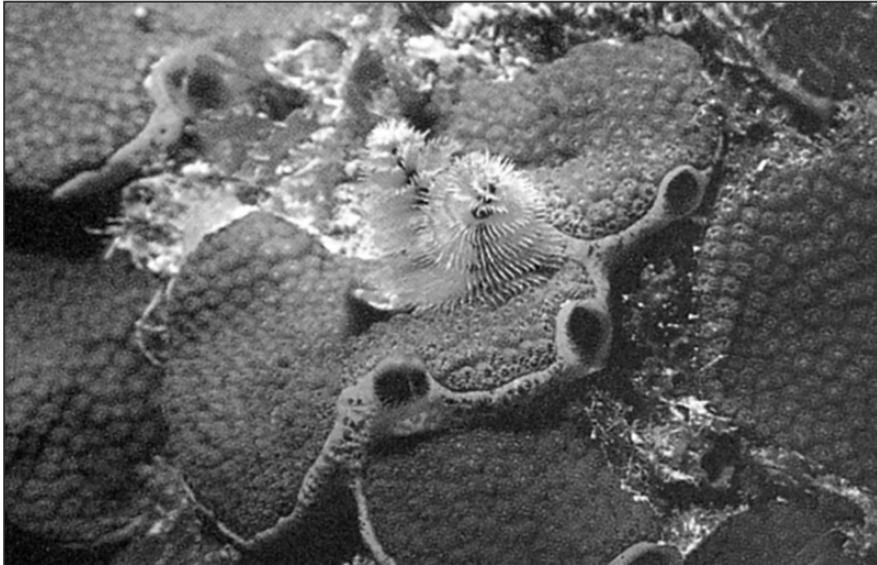


Figure 12.17

Marine Demospongiae on Caribbean coral reefs

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A



B



C