



Stuck in Time

A basic knowledge of sea
sponges

By: Nancy Deters

Sea Sponge

There are many different creatures that live on this planet. But very few are almost as old as the planet itself. A few of the creatures on this list are Cyanobacteria, Nautilus, Jellyfish, and Sea Sponges. Sea sponges have been around since the Precambrian time period which took place between four billion years and 543 million years ago, putting it on the list of the oldest living species on the planet. They are an animal that is found throughout the different types of waters, but very little is known about them to everyday people. Sea Sponges are very unique organisms in the aquatic world, which gives them their own animal kingdom, Porifera. They lack certain parts that are found in many creatures and unique structure to make up for it. Sponges also come in a number of different types, based of different attributes. This article will give you basic knowledge of sea sponges.



What is in a Sponge

Spicules- This part of the sea sponge can be seen by the naked eye, these once are called megascleres, while smaller microscopic ones are called microscleres. They are a part of the sea sponge structure and provide support. These spicules are also used to deter predators.

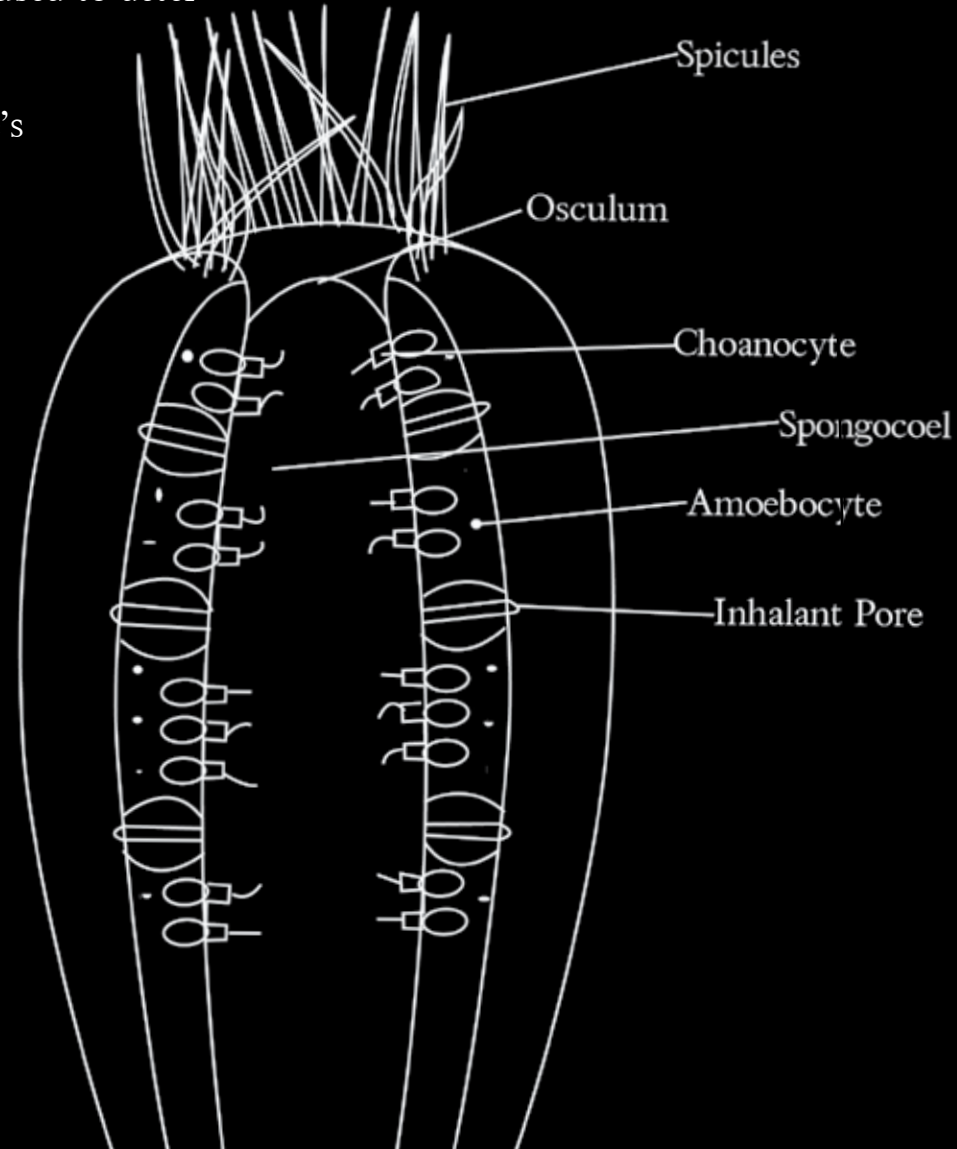
Osculum- This area of the sea sponge is used to remove the sponge's waste. Its part of the exterior structures of the sea sponge, which allows the water that enters through the spongocoel to exit.

Choanocyte- They are also called “collar cells”, choanocyte create a flow of water through the pores. This creates improves respiratory and digestive functions.

Spongocoel- The spongocoel is the large cavity in the central area of the sea sponge. Water enters into this area through the pores in the outer structure; the choanocytes that line this area create a current which exits through the osculum.

Inhalant pore- This is where water enters into the sea sponge and brings in nutrients.

Amoebocyte- These cells are very important to the feeding and the clearing debris that block the ostia. They are able to change into any type of cell in the sea sponge.



Types of Sea Sponges

There are over 5000 different types of known sea sponges and all are part of the Porifera family. The Porifera family is comprised of three different groups of sponges Hexactinellida, Demospongia, and Calcarea. Along with three different types of body structures the asconoid, syconoid and leuconoid.

The asconoid body type has a tube like shape to it. Syconoid sponges look similar to asconoid types but they have a larger body. The pores on these sponges are also longer because of its thicker cell walls. Leuconoid sponges are the largest and the most complex of all the types of sponges. They have the most tissue which is penetrated by number of different pores which lead to other chamber that end in the spongocoel. The groups of the sponges also have unique parts to them. Calcarea is the most primitive of the group, there are 400 types of sponges that fall into this category. The common feature of these is a supporting skeleton, which are made of calcareous in a star shaped structure. This group contains all three types of body structures. Hexactinellida are also called the Glass Sponges. Their skeleton is made up of silica. They have a mostly cylindrical shape but can have cup, urn, and branching shapes, which makes their body shape fall into the leuconoid group. The last group is the demospongia; there are 4750 species that fall into this group. They have that largest types of sponges and are the most brightly colored. Demospongia can be shaped like an urn or have finger like growths, putting them in the leuconoid group.



A large, light brown, porous sea sponge specimen is shown against a black background. The sponge has a complex, branching structure with many small openings and a fibrous texture. It is positioned diagonally across the frame, from the top left towards the bottom right.

How do they Eat

Sea sponges are unique in the fact that they have no nervous, digestive or circulatory system. So how do they get nourishment? They rely on the water flow system that takes place inside of them. The pores are on the outside of the sponge take in water that allows particles to enter. But, not all of particles can enter, they have to be a certain size, anything larger than fifty micrometers can't fit through the ostia (the sponge wall). If the particle is five tenths to fifty nanometers big it will be able to enter the pores, there it will be stuck inside of the pores and will be consumed by the archaeocytes. Still if the particle is even smaller than five tenths of a nanometers it will be caught and consumed by the choanocytes. With most particles in the ocean and other water are smaller the point five nanometers about eighty percent of the sponges nourishment comes from those particles.

Where can you Find Them

Sea sponges can be found in waters through the world, mostly in salt water, but there are 150 types of sponges that are found in fresh water. The different types of sea sponges can be found in certain kinds and places in water. Calcarea can be found mostly in tropical water, but about ten species can be found on Norway's coast. They are mostly found in shallower sheltered waters are less then 1000 meters deep. Hexactinellida is found between 200 and 1000 meters below the water surface, mostly found in the Antarctic. The demospongiae group can be found in the abyssal zone, 4000 to 6000 meters below the water surface. A few types of demospongiae are found in fresh water. With so many places to find sponges it makes them easy to study.



How the Images Where Taken



The pictures taken for this article were fairly simple. Most of these images were taken using a Canon 5D Mark II and a Canon 65mm macro lens. Along with this lens I also used a few thimble lenses. To light up the samples I used a ring flash and placed them all on a black background.

Gallery



Gallery





About Me

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About me: I am currently a third year student at Rochester Institute of Technology, Majoring in Photographic Sciences with a concentration in biomedical photography. I am also getting a minor in Archeological science.



Photo Credit:
Shannon Wright